

**Ontario
Recreation
Society**

A Guide to Computer Use in Leisure Services

COMPUTERS ARE



Ministry of
Tourism
and
Recreation

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Preface

In recent years the public has shown an increased awareness of leisure and the important role it plays in improving the quality of their lives. This, combined with an increase in available leisure time, has led to greater use of many recreation facilities, as well as higher expectations of the service provided by recreation organizations.

For community and government recreation agencies, there has been an added concern. The public has become more conscious of how and where their leisure dollars are being spent. For government agencies, politicians are more closely scrutinizing budget allocations. With the increased concern over expenses, leisure service agencies are finding themselves increasingly accountable for their expenditures.

Many parks and recreation organizations, whether public, private or voluntary, are faced with the problem of how to maintain or improve their level of service, often without increased funding. In response to such pressure, practitioners are looking for innovative ways to save money and make the most efficient use of their available resources. With varying degrees of success, some agencies have started to use computers in order to improve their operation and provide important management information.

A number of recreation agencies have proved that computers can contribute substantially to the management and operation of their organizations. However, the majority have not yet begun to harness the full potential of this new technology.

As many of our colleagues are pondering the various possibilities in using this new technology, the computer industry has been undergoing some rapid and major changes.

In the past, when computer equipment was very expensive and required specialists to operate, it was difficult for many organizations to justify its expense. The current trend in the industry has been for decreasing costs and increasing capabilities. As a result, computer use by both private and public institutions has greatly increased.

Advances in the computer industry have enabled organizations to acquire powerful data processing equipment at more affordable prices.

Computer manufacturers have become increasingly aware of the fact that if they could make their products easier to use, more people would be interested in using and purchasing them. In order to tap into this mass market of non-technical users, the computer industry is now producing equipment which is increasingly 'user-friendly' and designed to be operated by individuals with little or no previous computer training.

The proliferation of computer use in all sectors of the economy has resulted in less expensive, more powerful and easier to use equipment. Computer use is here to stay.

It appears that more parks and recreation practitioners also realize that computers, if properly implemented, can provide very real benefits for their organizations. The question faced by many parks and recreation practitioners is not whether to use the new technology, but when and how.

The problem which faces parks and recreation administrators appears to be finding the time and the technical resources to fully explore the potential of this new technology. We often find ourselves intimidated by the range of computer hardware and software available on the market today and the seemingly never-ending array of jargon. How can we tell which products would be most appropriate for our unique needs?

Irrespective of the size, location or type of agency, most share similar questions and concerns.

"Can I really trust my information to a computer?"

"I have absolutely no computer training - can I be expected to benefit from this technology?"

"What would these benefits be?"

"What is involved in installing a system?"

"What are the hidden costs that I should expect to pay?"

"How will I know which hardware and software is best for me?"

"Where do I start?"

This guide is designed to provide answers to some of these questions and to encourage administrators in our profession to explore the use of this new management tool.

Introduction

1. OBJECTIVES

This guide is written for administrators in recreation, parks, and cultural and community services who have had little or no previous experience with computers.

The overall objective of this guide is to serve as a foundation - a starting point for further investigation into the use of computers in parks and recreation agencies. More specifically, the objectives of this guide are: to increase awareness of computer applications in our profession; to encourage prudent implementation and utilization of computer systems; and to encourage the sharing of application ideas and experiences amongst practitioners.

1.1 Increase Awareness

Many of us realize that computers can benefit our organizations, but are not sure of exactly how. We know that computers have contributed to business firms in many ways, but just what can a parks or recreation agency do with computers? Even those of us currently using the technology may only be doing so on a very limited basis.

This guide will present a range of existing and potential parks and recreation applications and an application directory which provides specific user references.

1.2 Encourage Prudent Implementation

This guide will highlight and discuss some of the critical issues to consider in the planning, implementation and use of a computer system. These issues will be examined from the organizational, technical and personal perspectives.

1.3 Encourage Sharing

Parks and recreation practitioners who are not familiar with computers will be able to identify colleagues who have had some experience with the new technology by referring to the application directory. Practitioners who are currently using computers but would like information about other potential applications will also be able to consult the directory for a listing of applications.

2. COMPONENTS OF PROJECT

This project is divided into two main parts: The Guide and the Application Directory.

2.1 Part I - Guide

This part of the guide starts off by looking at the basic concepts and components of a computer system. It then examines various parks and recreation computer applications using "off-the-shelf" packages as well as custom-designed software. The last section is devoted to the discussion of some of the pertinent issues in the planning and implementation of a computer information system.

2.2 Part II - Application Directory

Part II includes the findings of a recent survey which documents the various computer applications and computer users in Canadian* parks and recreation services. The information is presented by software application and type of hardware.

3. HOW TO USE THIS GUIDE

3.1 Parks and Recreation Administrators

The primary audience for this guide is parks and recreation administrators who have little or no technical training. The guide will provide a brief review of computer concepts to help plan for the computerization of your organization. It lists a range of possible applications and outlines planning and implementation considerations. The software directory portion supplies a network of possible contacts for more information.

3.2 Politicians and Board of Directors

Politicians and boards of directors are usually responsible for overseeing the

* In the United States, a similar directory has been compiled by the National Recreation and Parks Association (NRPA). For further information on the NRPA directory please contact Jeff Stuyt, Dept. of H.P.E.R., Texas Tech University, Box 4070, Lubbock, TX 79409.

funding of computer information systems. These groups may be particularly interested in cost/benefit considerations, or answers to questions such as "Why does a parks and recreation department need a computer?" or "How can a computer contribute to parks and recreation services?". They may be interested in the sections on applications as well as the overall implications of a computer information system.

3.3 Data Processing Professionals

Data Processing professionals may not be fully aware of the potential for computer use in parks and recreation. This group will probably be most interested in the listing of potential applications, as well as the possibility of developing contacts with their counterparts in other organizations through the software directory.

4. APPROACH

Each parks and recreation agency has its own unique characteristics and variables. It is impossible to suggest one implementation plan which would suit all situations. As a result, the information presented in the guide should not be considered a 'cook book' approach to computerization.

What this guide does is offer suggestions and highlight the key issues involved in most organizations' computer applications. Look at it as a 'first step' designed to increase your awareness and to serve as a foundation for future investigation and learning.

This should not be considered a computer literacy manual. Bookstores and libraries are already full of publications relating to computer literacy. Computer terms and concepts will only be discussed to the degree required to enhance the understanding of the content of the guide itself. Technical terms will be used only when necessary to explain aspects of computerization or the managerial impact of computers.

The information is presented from a managerial rather than a technical perspective. "Computer jargon" will be avoided as much as possible. If you encounter a term with which you are not familiar, a glossary has been included in the appendix. For those interested in additional information, further readings are suggested.

Chapter 1

Basic Computer Concepts

This chapter provides a brief overview of the basic concepts of a computer system. "Technical" background information is provided to enhance the understanding of the subsequent topics discussed. Also included are explanations of some of the most often used terminology in the computer industry.

1. HARDWARE TYPES

The computer industry usually divides computers into three major categories: mainframe, mini and micro.

1.1 Mainframe Computers

Some of us were exposed to mainframe computers in the course of our formal education. These are large and sophisticated machines, usually requiring a team of trained specialists to operate. They are used primarily in organizations such as universities, banks and government institutions. Most of the early (more than five years ago) parks and recreation applications were developed to run on this type of computer.

If your agency is part of a large municipality, or if you obtain services from a service bureau, the printouts you are receiving are more than likely generated by a mainframe computer. Examples of mainframe computers include: IBM S/370-168, BURROUGHS-165, Honeywell 66/80, Amdahl, Cray, etc.

1.2 Mini Computers

Mini computers are smaller than mainframes and are quite popular amongst medium size corporations and municipalities. They usually require specialists to install, but existing staff can be trained to operate them without the assistance of full time data processing staff. Like mainframes, most minis are capable of supporting many users at the same time. Examples of mini computers include: IBM System 36, MAI BASIC-4, SPERRY System 80, WANG VS 100, Hewlett-Packard-L50, Dec-(PDP & VAX), etc.

1.3 Micro Computers

Micro computers are the newest and least expensive entry into the computer industry. Many are marketed for professional and managerial personnel and consequently do not require full time data processing professionals for installation or day to day operation. To cater to mass market appeal, many micro software packages are increasingly 'user-friendly'.

Although there have recently been some major developments in multi-user capabilities, a vast majority of existing micros are designed to support only one user at a time. As mentioned earlier, the micro computer will be the focus of this guide. Examples of popular micros include: IBM-PC, IBM-AT, Apple, Altos, etc.

As the cost/performance ratio of all three types of computers keeps improving at a very rapid rate, the lines between the different categories of computers are getting very blurry. For example, it is not uncommon to find some sophisticated business micro computers whose capabilities exceed those of the minis in use three years ago.

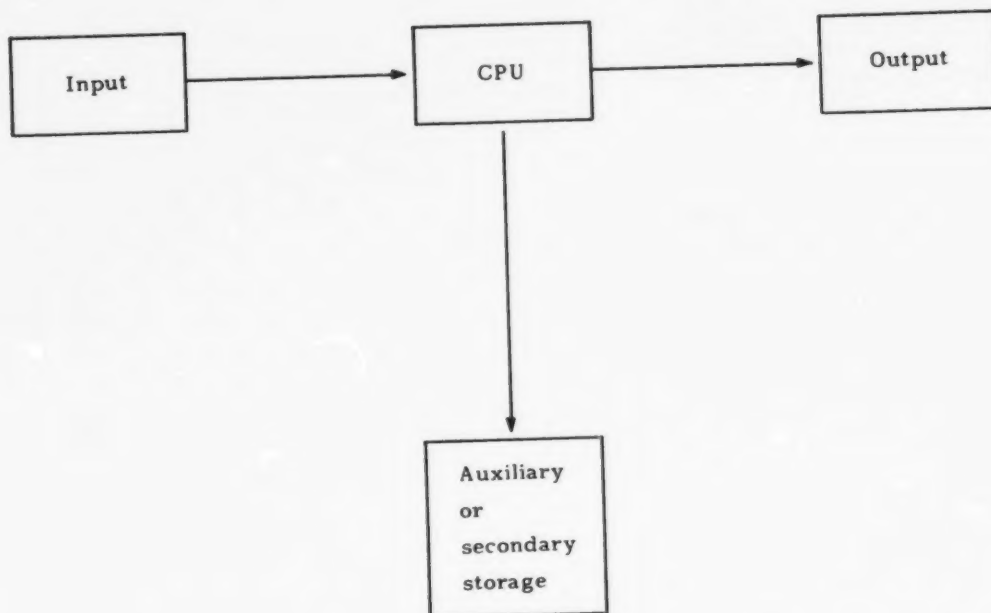
2. COMPONENTS OF COMPUTER HARDWARE

Most computers, regardless of type, size or price, consist of the same basic components: input, central processing unit, output, storage, and various peripherals.

In the following discussion of the components of a computer system, we will focus specifically on the micro computer. Figure 1 shows the basic components of a computer system, and figure 2 presents a more detailed look at examples of component devices.

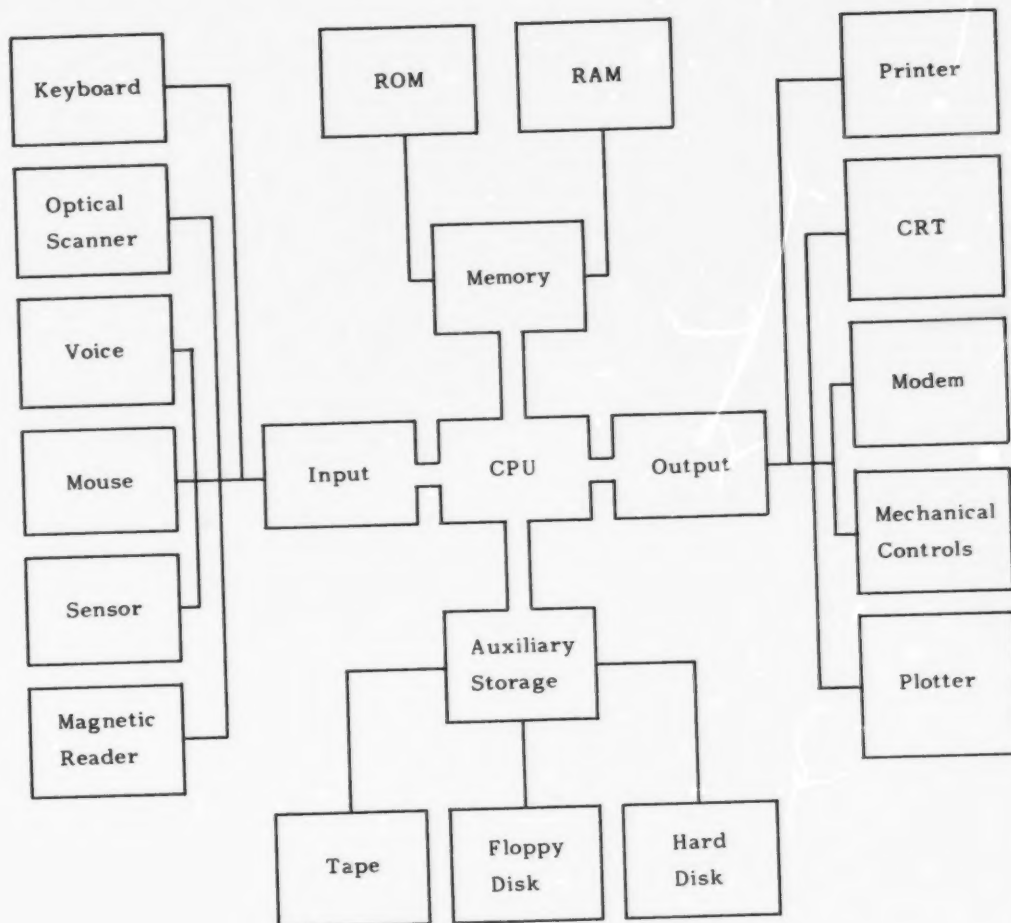
BASIC COMPONENTS

Figure 1



EXAMPLES OF COMPONENT DEVICES

Figure 2



2.1 Input

The primary function of the various devices is to feed data into the computer system. The most common input device is the keyboard. In recent years however, an increased emphasis has been placed on ease of use and other methods of input have become popular as well. The following are examples of other input devices.

Optical Scanner

An optical scanner can be used to read type-written documents or bar code information into the computer. Potential applications include inventory control and pro-shop management.

Voice

Voice input devices can be used to control various functions in some computer systems. Research in this area has allowed many users with little or no typing skills to interact with the computer. Also, voice recognizers have enabled many disabled people to live productive lives.

Mouse

The mouse is a pointing device which, for some applications, greatly facilitates human interaction with the computer. Although some users still tend to think of the mouse as little more than a 'gimmick', this type of device is in use in many serious applications. Instead of memorizing various abstract computer commands, some systems now allow the users to issue these commands by using the mouse to point to various pictures or functions on the screen. The mouse generally provides a less threatening way for individuals not familiar with keyboards to use a computer.

Sensor

These devices are used to convert physical measurements into computer readable data. For instance, a sensor may be used to monitor the ice temperature in an arena. If the temperature changes, the sensor will notify the computer which will in turn make the necessary adjustments to the cooling system.

Magnetic Reader

A magnetic reader can be used to read magnetically stored codes into a computer. Popular examples of magnetic readers are credit cards or banking cards. This device has been applied to member access control in various public and private clubs.

2.2 Central Processing Unit

The Central Processing Unit (CPU) is the 'brain' of the computer. This is where the data processing actually takes place. The power of the processor determines the speed of processing and the complexity of program which a system can handle.

There are two major types of processors for micro computers: 8-bit and 16-bit. The 8-bit processors can be found in most of the home computers and older business micro computers. Whereas the 16-bit computers are found on the newer business micros.

If you are considering acquiring a micro computer, you may want to favour the 16-bit machine as most of the popular and powerful business software is and will be written for this type of machine.

2.3 Output

The two most common output devices are printers and computer screens.

There are two main types of printers: dot matrix and letter quality. Dot matrix printers form letters using a series of dots, whereas letter quality printers print out entire characters like a typewriter. In the same price range, the dot matrix usually prints faster than the letter quality but has an inferior print quality.

Dot matrix printers are quite acceptable for generating internal reports, budget printouts, etc. However, most organizations prefer to use the letter quality printer for correspondence. Dot matrix printers generate letters that look as if they are part of a mass mailing (which is usually true). The 'personal touch' that personalized letters are intended to convey, is often lost if that letter is printed on a dot matrix printer.

Screens

Computer screens are often referred to as CRTs (Cathode Ray Tubes). There are two major types of computer screens: monochrome and colour. The quality of a screen is determined by its resolution, or crispness. For the same price range, a monochrome screen usually offers much better resolution for displaying textual information than its colour counterpart. For processing graphic information, most systems require a colour screen.

Examples of other output devices include: modem (for data communication), mechanical controls, plotter (for drawing graphics images), etc.

2.4 Storage

The most common mass storage devices for small business computers are floppy disks or diskettes, and rigid disks. Sometimes the rigid disk is also referred to as a hard disk or fixed disk. The rigid disk can store a great deal more information than the floppy, and can also provide more rapid access to the data. Although the cost of a rigid disk system is substantially higher than that of a floppy disk drive, the per unit storage cost can be less.

Depending on the type and size of the disk, a floppy disk can usually store from 45 to 600 pages of information. A micro computer rigid disk, on the other hand, can store 2,500 to more than 30,000 pages of information. The storage disks for large mainframe computers can store millions of pages.

For most applications that require the storage of large data files, the rigid disk offers the most satisfactory performance.

Tape is also used as an auxiliary data storage device for computers. Since tape drives usually access information sequentially, their data access speed is usually too slow for most of our applications. They are mainly used as backup storage medium.

Other Devices

The term 'peripheral' usually refers to some additional piece of computer hardware. Like accessories for cars, many peripherals are not absolutely necessary for making a

system work. However, they can make your system run much faster and smoother. Examples of peripherals include: memory expansion cards, pointing devices such as mice or light pens, optical recognition devices, modems, voice recognizers, graphics tablets, etc.

The set up of the various hardware devices differs according to the type of computer. For example, for most micro computers, all the components ie. keyboard, screen, CPU, and data storage are all packaged into one compact unit which can probably be kept on a desk top. In mainframe and mini computers, the work station will probably consist of a terminal (keyboard and screen), while the CPU and storage may be located elsewhere.

3. SOFTWARE

Computer software is a set of codes which is used to instruct a computer to perform specific processing tasks. Computer software can be divided into four main categories: system software, languages, generic software and application packages.

3.1 System Software

System software includes the operating system of the computer. The operating system is a set of control programs designed to monitor and manage the interfacing of the various hardware and software executions within a computer system. Examples of popular mainframe operating systems are VM/CMS and TSO, popular mini computer operating systems include PIC and Unix, while micro computer operating systems include MS DOS, PC DOS, CPM and PRO DOS.

Most software packages are designed to run on a specific operating system. Therefore, you may not be able to exchange programs with your colleague unless both computers involved use the same operating system. Many of the incompatibility problems in the computer industry are caused by the lack of standards in operating systems.

Selecting an operating system is a major and long term commitment. If possible, select one with a large user base. Operating systems with a large user base usually offer a much wider range of applications software. Selecting a seldom-used operating system, regardless of its features,

can greatly limit your software choices in the future.

3.2 Languages

Computer languages can be classified into two main categories: low level and high level languages. Examples of low level languages include machine and assembler codes. Programming in low level languages takes a great deal of training and patience. The codes are usually quite processor specific. It is highly unlikely that a typical practitioner would write his or her application in low level codes.

Examples of popular high level languages include: Basic, APL, Pascal, Cobol and Fortran. All of these languages have strengths and weaknesses depending upon their application. The Basic language is by far the most popular language used for micro computers.

Compared to generic and custom software, programming languages require the most amount of training for the user. Although almost anyone can learn how to program in one or more of these languages, the implementation of a system usually requires the service of an experienced programmer. On the other hand however, the language itself is very adaptable, and with proper programming can be used for a wide variety of applications.

3.3 Generic Software

Generic software refers to a family of "off-the-shelf" general purpose software packages. They are usually easier to learn than a programming language. Much of this type of software is non-procedural in nature. In other words, rather than requiring the operator to issue step by step instructions to the computer (as is the case in most programming languages), the user tells the computer what he or she wants to accomplish and the program itself figures out and executes the step by step procedure. Examples of popular generic packages include electronic spreadsheets, data base management and word-processing packages.

Generic packages vary a great deal in cost. Most are designed to be used by non-technical end users who have had little or no previous computer training.

Many generic packages are quite adaptable in their applications. For example, a data base management package can be used for anything from program registration, to scheduling, to various inventory functions, etc.

3.4 Application Packages

Application packages are software designed by a specialist to perform a specific function. They are also referred to as 'custom' software. If designed and implemented properly, they can address the precise needs of an organization, and are usually easiest for end users to learn to use. Well designed application packages are often menu driven systems which assume little or no previous computer experience on the part of the user.

Application packages (custom software) are usually the most expensive to implement and require more time for testing and implementation. As this type of software is designed for one specific application, they are the least adaptable of all software types. For example, a program designed for the unique requirements of one organization may be difficult to adapt to another. Similarly, a program designed for scheduling arena bookings can probably not be used for any application other than scheduling.

Chapter 2

Generic Software

For the context of this guide, generic software represents a family of "off the shelf" computer programs usually geared for non-technical users. We are going to look at an array of generic software in this chapter and discuss existing and potential applications for our profession.

Generic software can range from simple to quite sophisticated, and although it is generally much easier to use than programming languages, some time will be necessary to acquire the skill to use them effectively. It is also worth noting, that although generic software can be used by non-technical end users, the development of sophisticated applications will still require some expertise in systems design.

"Most "user friendly" software is not user friendly. A considerable amount of time is required to learn how to use this stuff efficiently..."

O.A. Jackson

Supervisor, Research Services
Hamilton Board of Education

1. ELECTRONIC SPREADSHEET

Electronic spreadsheets are one of the most popular general software applications for micro computers. An electronic spreadsheet is the equivalent of a computerized accounting worksheet. Like the worksheet, an electronic spreadsheet has both columns and rows to help organize information into a standardized form. The electronic worksheet is usually much larger than the paper worksheet. They can range in size from 20 columns by 50 rows to over 2,000 columns by 2,000 rows.

Spreadsheets can be used to perform a variety of tasks and can save a tremendous amount of time in doing budgets or financial statements. Compared to the manual method which involves using a pencil and calculator, the spreadsheet is faster, more efficient, more flexible and less prone to calculator error. Spreadsheets help eliminate the tedium associated with many calculating tasks.

Using a formula, an electronic spreadsheet allows a user to define a cell (an intersection of a row and column) as a

function of another cell or group of cells. Once a user has defined the relationship between the rows and columns of his or her worksheet, the entire worksheet, formulas and all, can be saved for future use. See figure 3.

Besides performing basic budgeting and accounting functions, an electronic spreadsheet also helps a user set up financial models.

As one practitioner identified, one of the major benefits derived from the use of computers is "The ability to develop effective forecasting models & simulations using a variety of data."

Based on the defined relationship between the cells, a user can easily ask a 'what if' type of financial modelling and forecasting question such as, "What will happen to our department budget if we give our staff a 50 percent raise?" or, "What would happen if the new arena use is only 75 percent of the expected, or 150 percent of what we expected?" etc.

Although there are a variety of electronic spreadsheets available on the market, most share the same basic features. Almost all let the user define a cell with the basic mathematical functions (+, -, X, /). Others allow the user to derive sum, average, net present value, internal rate of return, etc.

Some of the more elaborate packages include certain basic data base management features such as data extraction and sorting as well as graphics capabilities.

'Templates' have been designed for some of the most popular spreadsheet packages. These include pre-input labels and formulas, as well as processing sequences. Templates are available for applications such as budgeting, chequebook balancing, rental management, etc.

1.1 Electronic Spreadsheets in Parks and Recreation

Due to its adaptability and ease of use, the spreadsheet is quite widely used by computer users in our profession. The

spreadsheet naturally lends itself to financial applications, and as a result, current uses in parks and recreation are mostly financial or budget related. Some agencies however, are using the column and page format of the spreadsheet to generate activity and facility schedules.

A manager can set up a budget with predetermined labels and formulas and have a subordinate fill in the figures. Similarly, a financial manager could set up a standard budget form for use by each individual department. Each department would then fill in its own information, the results would automatically be calculated and the forms could then be consolidated to generate an organization-wide report.

As more and more practitioners use electronic spreadsheet software, we should start to see parks and recreation templates for sale or for sharing. Examples of such templates may include department budget, pool inventory, golf course applications, etc.

1.2 Notes

When selecting an electronic spreadsheet, you may want to look for one that has more worksheet space than you currently require. It's always better to have more space than you need, than to run out of space sometime in the future.

Consider purchasing one of the more popular spreadsheets to enable the future exchange of templates with your colleagues if the need or opportunity arises.

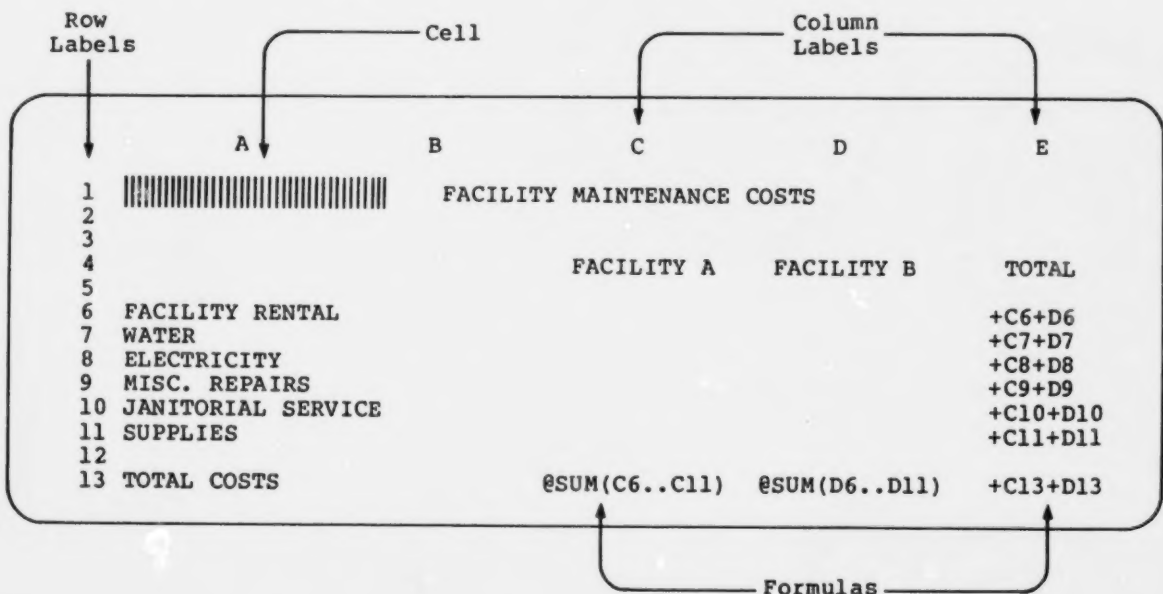
It is advisable for the head of finance to develop a standard template or budget form, and for this form to be used throughout the department. This will greatly ease the sharing or consolidating of information at some later date.

Figure 3

	A	B	C	D	E
1	FACILITY MAINTENANCE COSTS				
2					
3					
4			FACILITY A	FACILITY B	TOTAL
5					
6	FACILITY RENTAL		\$24,300.00	\$25,300.00	\$49,600.00
7	WATER		\$785.00	\$820.00	\$1,605.00
8	ELECTRICITY		\$13,564.00	\$13,989.00	\$27,553.00
9	MISC. REPAIRS		\$984.00	\$10,036.00	\$11,020.00
10	JANITORIAL SERVICE		\$11,975.00	\$12,456.00	\$24,431.00
11	SUPPLIES		\$ 1,534.00	\$14,786.00	\$27,320.00
12					
13	TOTAL COSTS		\$64,142.00	\$77,387.00	\$141,529.00

This is a simplified example of how a spreadsheet can be used to calculate total facility expenditure.

The spreadsheet below shows the formulas used. When a cell has been defined by a formula, changes made to other cells will automatically alter the results in the formula cell.



2. WORD PROCESSING

Most of us are familiar with the term 'word processing' and have some idea of what it means. At the very minimum, word processing performs the same basic functions as a typewriter and can be used for most basic typing duties. Among its many advantages is the ability to alter documents any number of times without having to retype the entire document each time.

Some of the basic capabilities of most word processing packages include the ability to: insert and delete text; move, copy or delete blocks of information; search and replace; center text; and, boldface and underline. Some packages offer optional spelling check programs.

Word processors were initially very expensive and it was difficult for the average user to justify their use. Advances in the computer industry have, however, led to a decrease in the cost of word processors and to an abundance of easy to use and less expensive word processing software packages.

The functions performed by a word processor and a word processing software package are sometimes quite similar. There are however some major differences between the two.

A dedicated word processor is a machine designed primarily for word processing. With the entire machine dedicated to one purpose, special keys are available to perform the most often used editing functions such as delete word, page, copy, etc.

A word processing software package is an application program which is designed to be run on a computer. If a computer is already available, the cost of purchasing a word processing software package is only a fraction of the cost of a dedicated word processing system.

Many of the more advanced word processing packages have the ability to use information generated by other software packages. For instance, participant information within a data base can be used to generate personalized form letters created by a word processing package. See figure 4.

2.1 Word Processing in Parks and Recreation

Word processing is one of the most common computer applications in our profession. It can be used for any 'typing' function such as memos, policy manuals, contracts, reports, letters, participant and membership listings and for the generation of form letters.

"A tender or large repetitive document which normally took approximately one week to type can now be done within two hour period."

P. Bruckler
Director, Recreation & Parks
City of Stoney Creek

Figure 4

DATA BASE INFORMATION

NAME	ACTIVITY	STARTING DATE
Smith John	Tennis	June 27
Doe Jane	Volleyball	August 15

Data base
information
can be merged
into a standard
form letter

FORM LETTER

Dear [NAME],

Just a short note to remind you that
your [ACTIVITY] lessons will be
starting on [STARTING DATE]. If for
some reason you will not be able to
attend the lessons, please let us
know as soon as possible.

to generate
personalized
mailings

Dear John,

Just a short note to remind you that
your tennis lessons will be
starting on June 27. If for some
reason you will not be able to
attend the lessons, please let us
know as soon as possible.

Dear Jane,

Just a short note to remind you that
your volleyball lessons will be
starting on August 15. If for some
reason you will not be able to
attend the lessons, please let us
know as soon as possible.

2.2 Notes

When selecting a word processing software package, we suggest you look for one which will be able to use information stored by your data base management package. This capability will prove very useful for mass mailings, form letters, and fund raising campaigns.

The efficient combination of a data base with a word processing package enables you to target your marketing effort. You will be able to direct mailings to a specific group based on criteria selected from the data base (eg. all individuals who are over 18 and have taken a fitness course in the last six months, etc.).

If you already have a dedicated word processor in the office and are shopping for a word processing software package, we suggest you select a package which is similar to the dedicated word processor. Many software packages have the same basic command structure as dedicated word processors. This will greatly reduce the operator's learning time for the new program.

You may consider selecting one of the more popular word processing packages so that if temporary help is needed, it will be easier to locate individuals who are familiar with the package.

3. DATA BASE MANAGEMENT

A data base is a collection of data which are shared and used for multiple purposes. A data base management system facilitates the retrieval, editing, manipulation and reporting of data within a data base.

Once data has been input into a data base, a user can use a set of commands to extract specific information. Most packages allow the selection of records based on criteria such as: more than, less than, equal to, not equal to, and, or, etc. Using a combination of these criteria, a user can locate very specific information. Consider again the example we used in word processing. In that case we extracted a list of individuals over 18 years old who were registered in a fitness course sometime in the last six months.

Aside from extracting data, most packages have the ability to sort, substitute, sum and count data. We could have counted for the

total number of registrants over 18 years of age who had taken a fitness course in the last six months, or summed for fees collected for fitness courses.

If used correctly, data base management systems can eliminate a great deal of the redundancy involved in the input and storage of data. Once the information has been input, the same information can be used for multiple functions. For example, in a registration system, once the registrant information has been input once, it can be used for generating class lists, billing information, user surveys, confirmation letters, etc. Also, by changing or updating information in the data base once, all applications that use the data will be updated.

Once the information has been entered, the possibilities are almost endless. Most packages also have a built in report generator for printing reports based on selection criteria.

Many of the better data base management packages have a query language which allows the user to access the information in a straight forward and non-technical way. In many of the progressive packages the language is increasingly 'English-like'. The command you have to type in may be as simple as:

"list the maintenance tasks done in Stanley Park between 01/01/85 and 06/01/85".

Some of the more elaborate packages allow users to access multiple files, and may allow simultaneous data access by multiple users. Some also have a built in procedural language so that a 'turn-key' menu package can also be developed.

3.1 Data Base Management in Parks and Recreation

Due to their capabilities for data retrieval and manipulation, the use of these packages is quite widespread in our profession. Many of the functions performed by recreation organizations seem to naturally lend themselves to data base applications. Examples of current uses include: inventory control, membership tracking, program registration, facility or site reservation.

3.2 Notes

Data base management packages are probably the most useful and important packages for the implementation of an integrated management information system.

As users become more familiar with the package, and knowledge of its capabilities becomes more widespread, there will be an ever-increasing number of demands placed on the package. It is therefore important to select a package that will allow room for future growth, otherwise you may find that need surpasses capability.

When shopping for a data base management package, consider the future possibility of multi-user demands being placed on the system, eg. multiple site registration or maintenance job entries. Another consideration to keep in mind is the possibility of having to upgrade to a more powerful machine. Some packages are capable of being upgraded, others are not.

When using data base management systems, it would be very helpful to have an overall departmental information plan. Without such a plan, you may find that different users and different sections are developing their own data base applications. What may happen then is a proliferation of unique files and applications. The lack of standard data formats and definitions will make future integration of data difficult, if not impossible.

4. PROJECT PLANNING

The successful completion of a project is usually the result of good planning. Good planning involves anticipating the various steps needed to complete the project, identifying the sequence of tasks, establishing a schedule, estimating resources available, etc.

Project planning software is a tool for planning, managing, and scheduling of projects. Originally available only on large mainframe computers, it was used to track mega projects such as major construction or space projects. This tool has since been adapted to micro computers and more and more managers are using it as a business management tool.

In order to use the software, the planner must first divide the project into a series of

inter-related tasks, which when completed, mark the completion of the project. The type of information required to describe each task includes: the earliest and latest beginning date; the earliest and latest completion date; responsible party; resources needed; percentage of completion; etc.

Project management packages can handle from a few hundred to a few thousand tasks. Based on the information supplied by the user, most packages can determine the series of tasks whose completion dates are critical to meeting the project deadline.

During the planning of a project, the relationship between tasks and resources can be fully explored. The planner can pose various 'what if' type questions to explore how a change in any task (eg. increasing resources, sudden or unforeseen delays etc.) will affect the overall project. For example "What if I had two more employees doing a specific task? What would happen if the second phase of the funding was delayed for two months? How would this affect the completion time of the project? How would it affect the total cost?"

Output is usually presented in a variety of forms depending on each individual package. Some of the most common forms of output include: PERT and GANTT charts, calendar displays, list of resources, etc.

4.1 Project Planning in Parks and Recreation

Project planning appears to be a very underused tool in the parks and recreation field perhaps because it still has relatively few users in non-technical areas.

It is useful in managing large projects that involve a combination of tasks such as the organization of major athletic events, major capital improvement or construction projects, fund raising campaigns or conferences, etc.

4.2 Notes

Project planning packages vary a great deal in the planning techniques they utilize. Determine your planning needs beforehand, and then select a package that best suits the needs of your projects and matches your present planning techniques.

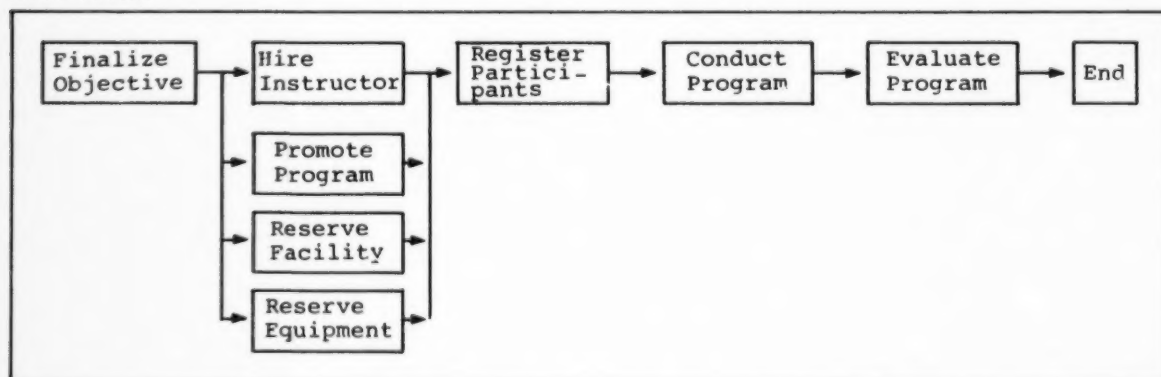
A project planning package contributes to a complex project in at least two ways. First of all, it is a good tool for *identifying* potential bottlenecks which may delay the completion of the project. Secondly, it is a good management tool for working with teams or committees. It can be used to

vividly communicate the responsibilities of each individual, and graphically show the importance of each individual's contribution to the entire project. Figure 5 depicts in simplified form, the steps involved in planning for a program.

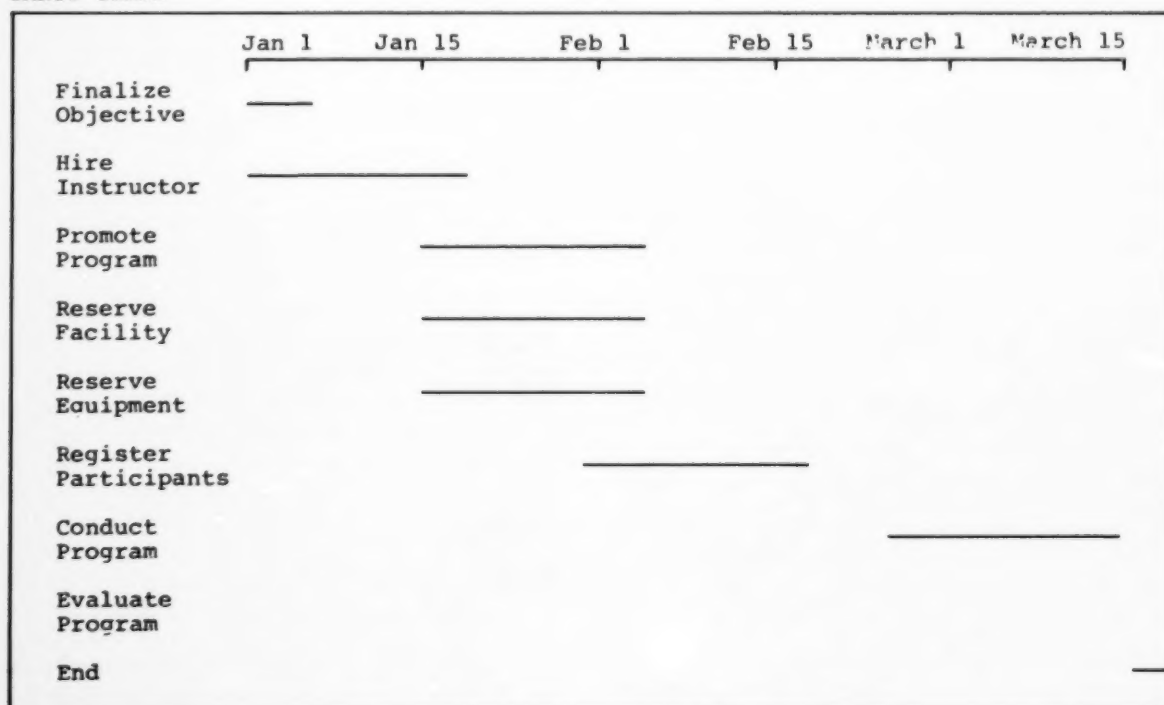
PLANNING FOR A PROGRAM

Figure 5

PERT CHART



GANTT CHART



5. STATISTICAL ANALYSIS

Statistical analysis refers to a variety of methods used to process, analyze and interpret data. A baseball statistician for example, calculates the batting average of a baseball player, a recreationist examines profiles of facility users, a politician analyzes government employee salaries, and a parks manager studies the performance of his maintenance crews. The possibilities are almost endless.

Although the analysis of large amounts of data and sophisticated set procedures is still the domain of mainframe computers, in recent years, very efficient packages have been developed to run on the micro. There are a great many packages available on the market today. They differ in ease of use, speed, quality of output, and the degree of statistical expertise they require.

5.1 Statistical Analysis in Parks and Recreation

Parks and recreation practitioners may find statistical analysis useful for the analysis of internal and external information. The analysis of internal data may include existing program registrant records, maintenance records, etc. The analysis of external data may include results of participant or market surveys, etc.

If properly used, a statistical package can summarize a large amount of data into concise planning or evaluation information.

5.2 Notes

One consideration in the selection of a statistical analysis package is the number of variables it can process. The number of variables usually proves to be more of a limitation than the number of cases involved.

If your organization is already using a mainframe computer, and you plan to do your analysis on a micro, you may want to look for a software package which is compatible with the mainframe. This will enable you to load information onto the mainframe sometime in the future for the processing of very large data sets or if very elaborate statistical analysis is required.

6. GRAPHICS

Computer graphics may be used in a number of ways, from simple charts and graphs to artistic expression and computer aided design. Most of us are quite familiar with the business use of graphics in pie charts, bar charts and line charts. As the old saying goes, 'one picture is worth a thousand words'. One picture will certainly retain the audience's interest much longer than a thousand words.

Some graphics packages have the capability of using information generated by other software packages (database, spreadsheet, etc.) as well as data input manually for each graph. Other packages will only accept data which is input manually. Both methods have advantages and disadvantages depending upon the type, purpose and audience for the graphs. If you are planning to use data generated by other programs, keep this type of compatibility in mind when shopping for your graphics software.

Although some graphics can be reproduced on a printer, most of the more elaborate or colour images require the use of a plotter.

6.1 Graphics in Parks and Recreation

Graphics capabilities can serve an important role in parks and recreation agencies just as they have in business. Practitioners are often faced with the challenge of presenting their ideas and positions to others. The presentation may be to a governing council for extra funding for a project, or to the public explaining a new fee structure or pricing policy. The ability to communicate our ideas clearly and concisely is a major factor in management effectiveness. To this end, graphics capabilities can be a great asset.

Another area for graphics applications is in mapping. Various types of data, demographical, topographical, soil, infra-red, etc. can be fed into the computer to produce different types of maps for planning purposes.

Graphics can also contribute to arts and music by adding another dimension to the type of programs offered in this area.

At the present time, graphics appear to be underused in our profession. The most frequent users appear to be planners and researchers for various types of mapping and planning.

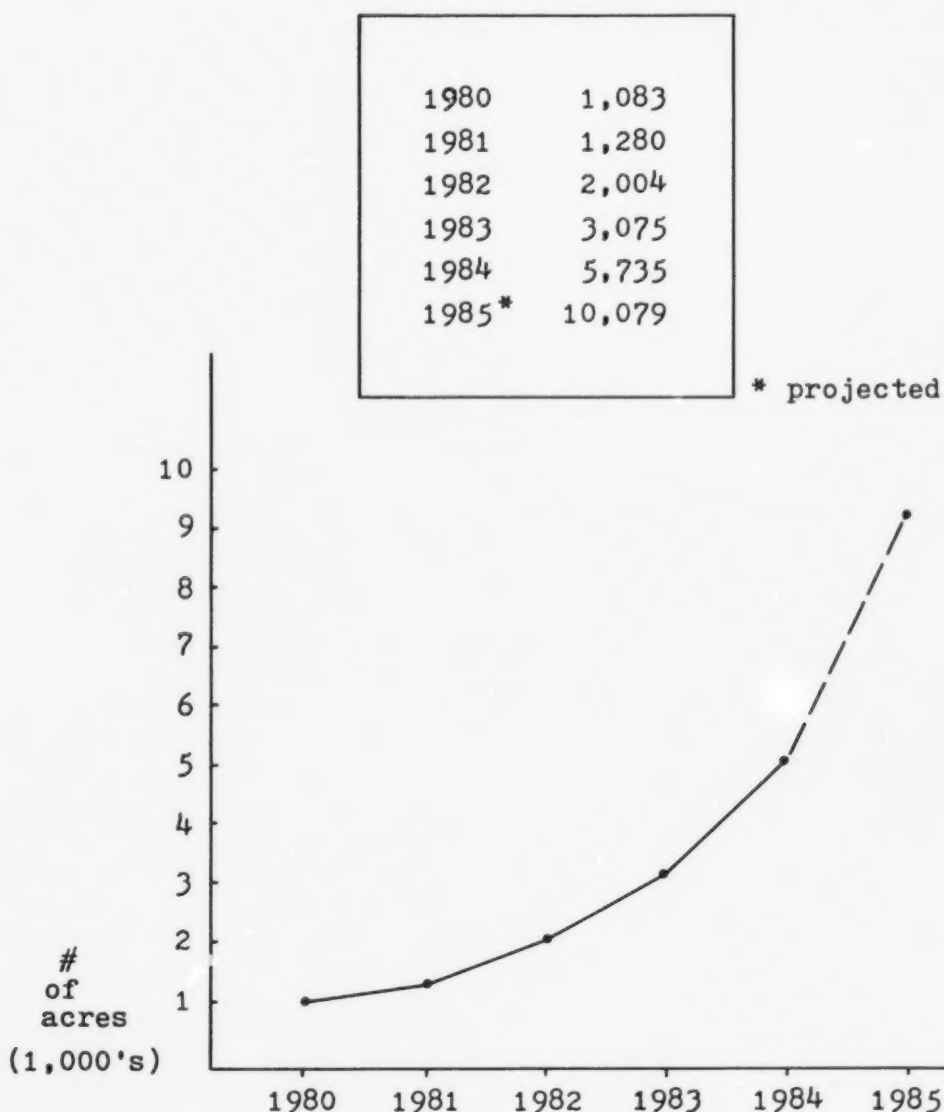
6.2 Notes

Those who use graphics find them to be an efficient way to summarize many pages of

text into a number of charts. They can prove very useful in council and committee meetings where it is important to be vivid, precise and convincing. For example, figure 6 shows increases in the number of acres of parkland maintained in both text and graphic form. It is generally easier to see trends presented in a graphic form.

ACRES OF PARKLAND MAINTAINED

Figure 6



7. COMMUNICATION

Communication is the transmission of computer information electronically from one point to another. These points can be as close as a few feet away, or as far as a few thousand miles away.

Most people think of a computer as a processing rather than communications tool. However, the communications capabilities of a computer will have as much impact on your work and personal lives as its processing capabilities.

There are some basic requirements that must be met in order for computer communication to take place. The first of these is a data source, next is a communications carrier (eg. a telephone line), and finally you need a receiver for the transmitted data. A modem is generally required to convert data from pulse (digital) form which is the form it takes in your computer, to wave (analog) form prior to transmission through the communications channel. A modem is also required at the receiving end to convert the data back to pulse form. See figure 7.

The speed of transmission is typically measured by the baud rate. Examples of frequently used baud rates include 300, 1200, 2400, 9600, etc. The higher the baud rate, the faster the speed of transmission.

Communications capability can be applied to large as well as small scale systems. On a global level there exists the ability to send or receive information to/from practically all cities and continents. On a smaller scale, communications networks can be found in a local area network. This allows electronic communication within a room, office or building, as well as the sharing of computer peripherals such as printers, storage, etc.

One specialty application of computer communications is electronic mail. Electronic mail refers to the delivery of messages by electronic means. There is usually little or no limitation to the length of message which can be transmitted with the speed and efficiency of a telephone call. Once received, the message is stored in a computer storage device. The recipient can access this information at any time from a compatible terminal. The message can then be filed, re-directed or erased. Electronic mail can put an end to 'telephone tag' and

enables one message to be sent to a number of recipients.

A message sent by electronic means can also be placed on a 'bulletin board' to be read by all other subscribers to that messaging service. An example of this type of message may be:

"Who has had some experience with (SPECIFIC TYPE) of tennis court surface?"

"Can anybody help me deal with the legal issues involved in a negligence suit?"

This type of 'bulletin board' messaging system is very spontaneous and transcends any organizational or regional boundaries.

Computer based messaging systems are available from many commercial sources including Telecom Canada (Envoy), Telenet (Telemail), and Tymnet (ON-Tyme II) all of which are North American based.

A communications software package can also be used to access public or commercial data bases. For a fee, these databases provide a wide range of information to the public. Some of the information is of a general interest nature, while some is more profession specific (financial, stock market, medical, etc.). Compuserve, the Source, Dialogue and InfoGlobe are examples of public databases.

7.1 Communications in Parks and Recreation

There are various ways in which the profession can benefit from the use of communications capabilities. Arenas or sports facilities can be linked for daily communication, or for special events held in various locations (eg. track and field meets) and the results are centrally tabulated. The 1984 Olympics in Los Angeles made wide use of this capability.

Other useful aspects include the ability to search public or commercial data bases for recreation or sports related information. Certain recreation data bases such as SIRC, SIRC, and the University of Waterloo Databank are already on-line.

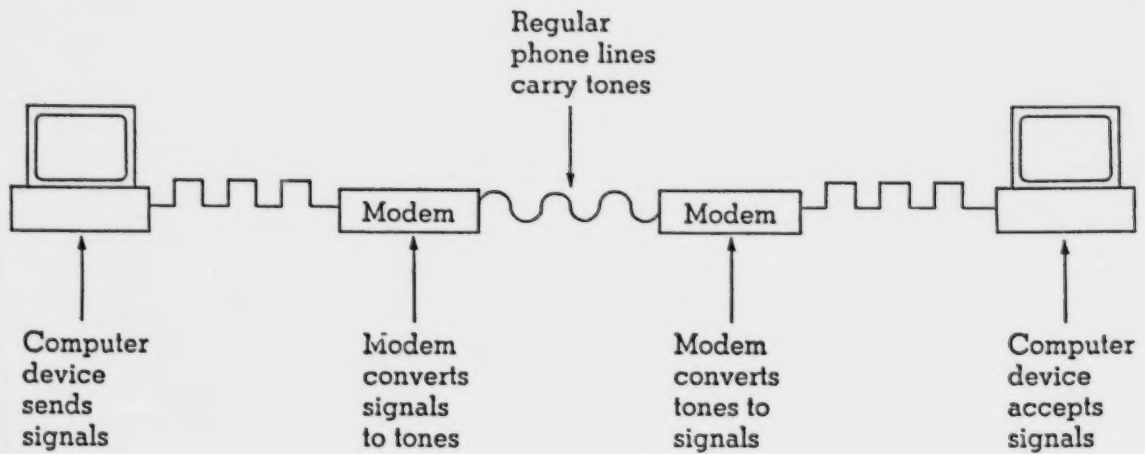
7.2 Notes

It is possible, in time, that communications capabilities may lead to the exchange of ideas and information. Widespread use of computer communications capabilities could promote networking within our profession.

Most practitioners today are faced with the need for current and accurate information. Taking into consideration the low cost and ease of use of electronic communications, it could efficiently be used as a tool for the exchange of information and ideas.

COMPUTER COMMUNICATION & MODEMS

Figure 7



Chapter 3

Parks and Recreation Application Software

This chapter presents some of the most popular parks and recreation computer applications. The applications discussed include: registration, maintenance, facility booking and reservations, league scheduling, financial functions and other parks and recreation applications. Each of the applications will be discussed under the format of general description of application, input information required, output information, and discussion.

1. REGISTRATION

1.1 General Description

Registration is one of the most popular computer applications in parks and recreation services. It can greatly reduce the repetitious and tedious aspects involved in a registration process. Registration systems have been used for camps, sports classes, interest programs, etc.

1.2 Input Information

The input information for a registration system typically consists of the data available on the registration form. Examples of this data include:

- registrant's first name
- registrant's last name
- age/birth date
- mailing address
- telephone number
- course/program name or code
- application date
- status (registered, waiting list, etc.)
- fees amount
- fees (paid/due)

A registration system usually includes additional information as well: course (starting and ending dates, location, instructor, pre-requisites, registration limitations, etc.); billing information; and instructor information.

A well designed registration system should be able to link all of these subject files together to minimize time spent inputting duplicate information.

1.3 Output Information

Output information from this type of program typically includes the following:

- class lists for instructors
- class schedules
- mailing labels
- targeted mailings
- billing/invoicing information
- user/participant profiles
- class evaluation report
- demographics and class type report
- participant/program type report

1.4 Notes

A computer assisted registration system can save a parks and recreation agency a great deal of time and money. Usually the user information only has to be entered once, and the computer will generate most lists, labels and reports.

"The computer is used for program registrations - have found them neater - more information is given on the receipt - there is less chance of error - processing of registrations is quicker - less work is involved."

L. Smith
Administrative Assistant
City of St. Catherines
Parks & Recreation Dept.

Organizations using such a package usually notice a decrease in staff time required for registration procedures. A registration package also provides tighter control over registration and cash. Future communication with registrants is greatly facilitated.

A well designed registration system can not only expedite many of the manual tasks involved in processing registration, but can also provide a summary of trends, preferences, budget, etc. for planning purposes.

A registration system can be designed to link with other files within the same information system. Examples of these may include course, facility, community agency and instructor files.

If your current manual registration system allows simultaneous registration from different sites within the community, you will either have to look into a multi-user system, change your registration process to take place at one site, or have the information mailed to one location.

If you have limited computer equipment, you may not want to automate the front-counter registration process. If for example, you now have four staff receiving registration information over the counter at peak times, replacing the four staff with one computer is going to cause a great deal of frustration among the registrants who will line up in front of the counter. It may be difficult for them to believe that the computer is there to serve them better. If this is the current situation, you may want to receive data in the existing manual way, and then forward the printed information to the computer.

2. MAINTENANCE

2.1 General Description

A computerized facility maintenance program includes programs designed to plan, budget, schedule and evaluate maintenance tasks. Such a package can be used for preventative maintenance as well as daily operational maintenance of facilities and can be applied to any number of facilities including parks, buildings, pools, roads, etc.

2.2 Input Information

The following input information may be needed:

- facility or parks inventory information (address, phone number, contact person, etc)
- type of facility (arena, community hall, etc.)
- description (size, number of rooms, size of rooms, etc.)
- maintenance history (major repairs, etc.)
- present condition
- energy consumption (water, electricity, etc.)
- performance standards
- labour team/crew information (optional)
- equipment inventory information (optional)
- materials inventory information (optional)

Job request card information:

- date of request
- job classification
- job description
- job location
- urgency rating
- estimated completion time
- budget code
- materials needed
- equipment needed
- weather requirement

2.3 Output Information

Examples of output information include the following:

- job status report
- job completion report
- job progress report
- equipment usage report
- task completion by crew/location/task code
- crew performance comparison report
- maintenance budget printout
- job scheduling
- reports on energy consumption

2.4 Notes

This type of package will allow more careful tracking of the condition and maintenance requirements of a facility, enabling more efficient preventative maintenance procedures. Other benefits include improved energy utilization, and often, longer equipment life.

This type of program will be able to provide maintenance managers with information regarding the costs of maintenance for each facility. The documentation of such data could prove valuable to support proposals for budget allocation or when issuing policy statements on users-fees etc.

Typically, maintenance programs may be linked to the following files: facility inventory, material inventory, employee, payroll, job performance, standards, etc.

Maintenance management programs usually provide standards and schedules and may be linked to labour cost tracking functions. These can later be used to analyze how staff time is spent, on what function, at which facility, etc. This can in turn then interface with the payroll system.

As with any system development project, a great deal of planning is usually required to implement a sound maintenance system. This planning would take into consideration the setting of maintenance standards, classification of job codes, etc. One thing to remember when assigning codes and classifications is that although the computer can deal with very fine classifications, your foreman and work crew may not be willing to do the same. We therefore suggest you classify the job code into only as much detail as is necessary, and no more.

3. FACILITY BOOKING AND RESERVATION

3.1 General Description

A computerized facility booking and reservation system may perform reservation and scheduling functions for a wide variety of facilities. Examples include athletic fields, parks, picnic sites, shelters, campsites, meeting rooms, halls, multi-usage space, swimming pools, gyms etc.

3.2 Input Information

Typically, the following input information will be required:

- facility inventory information
- condition of facilities
- damage or vandalism records
- name of requesting party
- address of requesting party
- telephone number of requesting party
- organization/affiliation of requesting party
- facility requested
- date and time requested
- rental rate for facility

3.3 Output Information

Output information will usually include the following:

- report on status (availability) of facility
- use authorization (permit)
- report on future bookings
- weekly/daily schedule for facility
- report on facility usage by type of facility
- report on facility usage by season
- report on facility usage by time

- various revenue reports
- mailing labels for client contact

3.4 Notes

A computerized facility reservation system provides accurate and up to date tracking of facility use. If the requested facility is not available, information on the status of other similar facilities is readily available. It also provides a clear indication of facility use for future planning.

"Once in full operation, the major benefits derived from computers will eliminate double bookings, identify the person who has made the booking transaction, keep a tighter control over budget revenues, more speed and greater efficiency."

G. Mallette
City of Ottawa
Parks & Recreation Dept.

A facility reservation system can usually interface with other management information system programs such as facility inventory, financial maintenance, staff, community groups, clubs, league scheduling, etc.

A well designed facility reservation system generally allows the users a great deal of flexibility in checking availability by day, time, location, type of facility, etc.

If your organization has phone in reservation, be sure that your system has an acceptable response time. A 15 second search time may not mean much while you are working alone with a computer. However, the same 15 seconds may seem like a year when a caller is waiting for the information on the phone.

4. LEAGUE SCHEDULING

4.1 General Description

A computerized league scheduling program can be used to schedule all types of sports teams or leagues. Some of the most popular league scheduling programs available include hockey, baseball, football, golf, etc.

4.2 Input Information

Input usually includes:

- team name
- participant name
- participant address
- participant phone number
- birth date/age of participant
- gender of participant
- fees
- insurance coverage
- win/loss record of team
- officials assigned
- game schedule

4.3 Output Information

Typical output information includes:

- team rosters
- team standings
- suspension list
- game schedule by team
- game schedule by facility
- game schedule by date and time
- report of league demographic data
- assignment of officials
- report on revenue and expenses
- labels

4.4 Notes

One of the major benefits of this type of application package is that it reduces time spent in the scheduling of teams and leagues. It provides accurate and up to date scheduling information.

There are a number of league scheduling software packages available on the market today. Many allow for custom features to be added to the basic program for a fee, but the overall cost will probably still be lower than having the entire package custom written for your application.

Many of these packages interface with word processing packages allowing for the generation of personalized form letters to league members. Ideally a league scheduling program should interface with facility reservation, maintenance, etc. as well.

5. FINANCIAL FUNCTIONS

5.1 General Description

Financial management functions typically include budgeting, accounts receivable, accounts payable, payroll, etc. Since many of the financial functions required by parks and recreation agencies are handled by their central agency or finance department, we will not elaborate in greater detail about the specific functions themselves.

5.2 Notes

The information generated by a financial management package is usually more accurate than information produced manually due to fewer opportunities for human or calculator error. In addition, many of the tedious and time consuming tasks associated with a manual financial management system are reduced.

One of the major benefits derived from the use of computers is, "Efficiency of preparing detailed financial reports particularly when they involve numerous calculations."

T. Commisso
Services Coordinator
Canada Games Complex
Thunder Bay

Some administrators have commented that the financial system supplied by their central agency is not really serving their needs. A frequent comment is that the financial printouts often arrive much too late to be of any real use, or that the budget breakdown is not detailed enough for their planning needs.

If this is similar to your situation, and you are considering implementing your own financial functions, we suggest you proceed with care. To have a duplicate financial system for a parks and recreation department could increase the amount of input time, and the technical and political effort of coordinating and integrating the two financial systems could be tremendous.

If you decide to go ahead with implementing a computerized financial management system, you may want to look at the ready made packages before you make up your mind about whether to design your own custom packages. In the business software market, there are literally hundreds of accounting and financial packages for you to choose from. Almost all of which will be less expensive than having a custom program designed for your needs.

6. FACILITY MONITORING

6.1 General Description

A facility monitoring system consists of computer systems which help to monitor and provide the most optimal use of a facility's mechanical devices. This type of computer system can help monitor: refrigeration units, air conditioners, different types of compressors, filtration pumps, hot water heaters, furnaces, etc.

6.2 Notes

Most of the input data for a facility monitoring system comes from sensors attached to the equipment or facility. The data is fed into the computer directly or via a modem through the telephone line.

The computer derives its input from the equipment as well as from the operating environment based on a set of user defined maintenance criteria.

This type of system allows the monitoring of multiple sites from one central location. It also logs all activities, alerts staff of any abnormal or emergency situations, and optimizes the operation of the equipment involved. Many users of facility monitoring systems have realized great savings in utility and equipment maintenance costs.

"Our present system is controlling and maintaining the refrigeration system in our Main Arena. As a result of the placement of this

system, we are seeing major energy savings, an efficient log system, and eventual extended refrigeration equipment life."

E. Martin
Director
Parks & Recreation
Stratford

7. OTHER PARKS & RECREATION USES

Examples of other applications in parks and recreation include:

7.1 Concession Management

A concession management program would keep track of information on suppliers, prices, inventory of food and equipment, inventory of part time help and hours available, portion of goods sold inventory, etc.

7.2 Club Management

A good club management package consists of a set of integrated programs designed to be used by health clubs, sports clubs, Y's or country clubs. Some of the functions performed by this type of system include: membership access control, locker assignment, membership tracking and accounting, facility reservation and league scheduling, member participation tracking, financial pro shop management, etc.

7.3 Nutrition Analysis

Nutrition analysis packages are designed for dieticians, fitness counsellors, education health professionals, etc. Many of these types of programs would include a data base containing nutrient values of food. The program would provide nutrition analysis and menu planning.

7.4 Fund-Raising

This type of program ranges from simple accounting packages which can be adapted for fund raising purposes to full-feature packages geared for large scale fund raising organizations. Besides the typical financial modules (accounts receivable, accounts payable, etc.) they also involve donor tracking and membership mailing functions.

7.5 Wellness/Fitness

This type of program usually consists of a set of assessment tools to assess wellness or fitness in a systematic manner. The overall idea is to heighten awareness of various aspects of health and health risk factors and to promote the idea of wellness.

This type of tool typically involves the administration of a questionnaire and a series of tests and measurements. The results of these tests are fed into the computer program for analysis.

The computer will then generate an overall 'wellness' assessment for the individual. It may provide specific references to reading materials, suggest exercises to strengthen certain parts of the body or provide a series of suggestions on life-style, nutrition, exercises, etc.

7.6 First Aid

In parks and in facilities where there is a high frequency of accidents, an accident tracking program could save the agency from a great deal of complaints as well as the inconvenience of law suits. An accident tracking system can also be linked to the first aid supplies inventory system.

Typically this type of program would divide the target area into grids, and include the following in the accident report: name, sex, age of patient, day/month/time of injury, location of injury, type of injury, treatment summary, witness information, (if applicable).

The output report may include: location of injury, nature of injury, day/time of injury first aid supply inventory report, etc. The information could then be used for site improvement, and staff scheduling.

Chapter 4

Planning and Implementation Issues

This chapter discusses some of the important issues pertaining to the planning and implementation of a computer information system. These issues are presented from the organizational, technical and personal perspectives.

1. ORGANIZATIONAL ISSUES

The issues discussed from an organizational perspective include: top management involvement, organization wide information planning, the information coordinator, timing of implementation and cost and benefit considerations.

1.1 Top Management Involvement

Top management involvement is one of the most important considerations in the implementation of a successful information system. Planning for a computer system should take into consideration the needs of the entire organization. For this reason, it is important for the planning to be guided by top management. This level of the organization is more likely to have a balanced view of the organization's overall information needs.

If for example, the task is assigned to a financial manager, most of the applications will likely be developed from the perspective of financial management, and other applications may not have received the proper emphasis.

Top management will probably have a more complete understanding of the long term information needs of the organization, including such aspects as how each department's application will eventually be integrated into an overall information system. They will also have a better understanding of the financial and budgetary constraints and the organizational politics which may affect the implementation process.

The implementation of a computer system may have far reaching effects on an organization. It will often affect the nature and scope of staff responsibilities within the organization. Some staff members who have had sole access to certain types of information will now have to share that

privilege with some of their colleagues. The responsibilities of individuals may have to be changed. As access to information becomes more widespread, the organization may find that its structure may become flatter.

In other words, the implementation of an information system may result in some fairly long term and major restructuring which will need the commitment and support of top management.

1.2 Organization Wide Information Planning

There are a couple of different approaches towards the implementation of a computer system in an organization. One of them is to approach automation from an application point of view. The other approach is to have an organization wide information plan.

Using the first approach, a department may acquire a registration system, then a facility maintenance system, followed by a facility booking system, and so on. Until the past few years, this appears to be the approach most often selected by parks and recreation agencies. The advantage of this approach is that one can implement an application in a relatively short time and see tangible results right away. However, without an overall organizational information plan, one may find that the independently developed systems may not be able to work well together and the organization may not be able to derive the full potential of having an integrated management information system.

The second approach would look at planning for the system from an overall organizational point of view, thus resulting in a comprehensive organization information plan. Instead of looking at individual applications, one looks at the various subjects an organization is dealing with and the type of data kept for each of the areas. Then the subject information can be used to point out the relationship with the existing functions performed by the organization. By mapping information in this way, one has a much better chance of seeing the inter-relationship amongst the data and thereby providing a much better long term data model for the organization.

Upon the completion of an overall organizational information plan, the implementation of the various information modules can be conducted by each individual department. In systems planning jargon this is called:

"top-down planning & bottom-up implementation".

In either case you will have to determine the following for all aspects of your information needs: flow (the sequence of information gathering and dissemination), volume (the amount of information to input, process and output), frequency (how often you will have to access the information), speed (the required speed of information retrieval), output forms (the format of output to screen or printer), number of users, communication requirements (how often communication will be required, the format of this communication), etc.

1.3 Information Coordinator

Many organizations find that assigning an information system coordinator greatly contributes to implementing a successful computer information system. This person can provide the consistency necessary to guide the development of an information system.

A common tendency when selecting this person is to look for some computer expertise. This may not necessarily be the most important trait for this individual to have.

First of all, they should have enough experience within the organization to have obtained a wide perspective of the organizations needs. Because this person may recommend new and sometimes unpopular recommendations, they should be well respected within the organization and carry a high degree of credibility.

Many organizations recommend that this coordinator should report directly to top management. Since the decisions they make may often affect their fellow workers, they may need the direct support of management to implement some ideas. They should also be made well aware of management's overall computerization goals to ensure that they do not pursue a project only to discover after considerable time and effort, that management has other ideas.

Other important personality traits for this person include high interpersonal and training skills. The nature of the job may entail introducing change, training users, etc.

This information coordinator will be in a position to have access to a great deal of information, some of which may be of a very confidential nature. The access to and control of such information will place this individual in a very 'powerful' position regardless of their formal position on the organizational chart. It is therefore important that this individual have a high degree of commitment to the organization, and not be likely to use this information to increase personal power.

The responsibilities of this person may include the following:

- provide direct training or access to training opportunities
- recommend or provide computer productivity tools to end users
- provide learning or reference resources
- disseminate useful and relevant information in the system
- encourage and facilitate increase in work productivity with the help of the computer
- maintain and update a data base data dictionary for the department
- maintain and upgrade existing software
- maintain and encourage the use of utility library programs
- coordinate sections' program development to minimize redundancy
- continually revise the program development plan
- data maintenance - security and back-up
- communicate with the organizations data processing department and/or outside technical consultants (if applicable)
- schedule the use of the equipment

The implementation of the system will take time. It is important not to assign the responsibilities of information coordinator in addition to this individual's existing tasks. If an organization is really committed to the success of the project, it should rearrange the person's responsibilities so that he or she can do their job well.

1.4 Timing

There are two issues pertaining to the timing of the implementation of an information system. The first of these is timing of procurement, the second is the timing of an application.

Timing of Procurement

Given the fast rate of change in the computer industry, and the constantly increasing capability and decreasing costs, many practitioners hesitate to invest the money, feeling that they may be able to get a better deal next year.

"Looking at the trends in the computer industry, wouldn't it be wiser to wait until the equipment gets cheaper and better?"

This type of comment is partially correct. No doubt, the cost and performance ratio of the equipment is going to continually improve. However, there is no indication of when the rate of advance in the industry will slow down.

The decision to wait for some indefinite time in the future may not be the best option. The decision of when to computerize should be based on the opportunity cost rather than the absolute cost of the computer system. In other words, if the computer system you intend to purchase now costs \$20,000, and if you estimate the combined financial and non-financial benefits of the system to be \$30,000 for the next three years. Then it would be logical to purchase the system now, even though you may be able to buy your \$20,000 system for a fraction of the cost three years down the line.

Timing of Application

Contrary to what some sales people may try to tell you, installing a computer system takes time. The implementation of any computer system will initially increase the workload of the organization. This increase in workload will be due to the extra time required to keep a manual system running parallel with the automated system. It will take time to input the current information into the computer, it will take time before the operator(s) is efficiently using the equipment, and in some cases, it will take time to test new programs.

With all this in mind, if possible, it is usually better to implement a new system or application at a quiet time in your operation. For example, if your peak season for program registration or parks maintenance is mid-summer, it may not be appropriate to implement a new registration or parks maintenance system at this time. Your staff may not likely have the time, energy or interest to devote to bringing up a new system at this time.

1.5 Relationship with Data Processing Department

Many practitioners are understandably frustrated when their data processing department appears to be less than responsive to their needs. We should however, try to understand the constraints imposed upon many data processing departments. Data processing departments are often over loaded by work requests. In addition to their demanding workload, they must also try to keep up with the ever changing data processing industry. Many do not have the opportunity to develop an awareness or understanding of the needs of the parks and recreation profession.

In many cases, the priorities of the data processing department are set by council, and are not under the departments control. Also, many of us may not fully appreciate the complexity of building an intricate information system. There is quite a difference between setting up a system to keep track of 200 telephone numbers and another to start a maintenance system which is related to equipment and materials inventory, payroll and other financial functions.

"There were initial cautions expressed by the Data Processing Department about the implementation of micros within the municipality. However, close consultation and education has resulted in a good working relationship and implementation of P.C.s with spreadsheet, Data Base, statistical analysis, word processing, network, U.T.S. emulation, and C.A.D. implementation. The Data Processing Department now attempts to ensure micro compatibility with the mainframe

and also, that someone within the department using micros is able to perform regular system maintenance as well as express commitment to the micro system"

J. Lohuis
Director of Recreation
City of Windsor

Each organization has its own unique qualities and individuals, the willingness of the data processing department to cooperate will depend mainly on these individuals and the constraints under which they operate. It is generally advisable not to antagonize or alienate the data processing department. In the future you may have to work with them in order to fully integrate your applications into the corporate system. Also, as the sophistication of your system grows, you may need the assistance of data processing professionals for checking data, back-ups, security, etc.

1.6 Costs and Benefits

In the end, whether or not you decide to go ahead with the implementation of your computer system will depend on whether the benefits outweigh the costs. What follows is a listing of the costs and benefits that you may consider in your decision.

1.6.1 Costs

Most of us are immediately aware of the monetary costs involved in the implementation of a computer system, but there are really two types of costs to be aware of: monetary and non-monetary costs.

1.6.1.1 Monetary Costs

Monetary costs include hardware, software, training, supplies, the preparation of the physical site (desks, tables, chairs, etc.), insurance, maintenance, etc.

Costs may vary a great deal depending on the type of hardware you decide to purchase, whether your software is pre-packaged or custom designed, the degree of staff training required, whether you want to purchase computer furniture or make do with what is already available, and so on.

It may be worth your while to see if any funding assistance is available for the acquisition of equipment or the training of staff.

Be prepared for recurring costs as well, such as supplies, insurance, maintenance, and updates for existing software packages etc.

1.6.1.2 Non-Monetary Costs

In many cases, the non-monetary costs discussed in this section could be greatly alleviated with the proper planning and user involvement.

Organizational Instability

In some settings, the introduction of a computer system can involve some major organizational changes. Staff may take on new or different responsibilities. Some staff may lose control over some information while others may gain access to information which they did not have before.

Some computer systems such as labour cost tracking, maintenance materials inventory, office staff productivity measures, etc. are designed to track the performance of employees. Some employees may feel that they are being constantly monitored by the machine. If not properly presented to the staff, such aspects may cause some antagonism towards the machine as they are forced to become more accountable for how they spend their time and budget.

Loss of Personnel

Loss of personnel is always a possibility with the implementation of a computer system. In most cases however, it is more a matter of changing job responsibilities. Some organizations actually report an increased workload resulting from computer use due to an increase in the amount of information which is requested. Any reduction in personnel usually takes the form of a decrease in the number of part time workers required during peak registration and budget periods.

"Once you have worked with the computer you will find there are so many applications for Recreation and Parks, that the savings you

anticipated do not become a reality as you will need additional staff to process this information."

G. Stahlman
City of Guelph
Recreation & Parks Dept.

Time Lost in Training

Regardless of how powerful or efficient a computer is, staff members will require some time to learn how to use the system. Time spent in training is almost always "unproductive". For example, if you have a package that takes four days to learn how to use effectively, and eight people in your department have to learn how to use the package, then a total of thirty two days will be spent in learning how to use the package. The time lost in training will probably not immediately contribute to their productivity.

Potential Disaster

Although nobody really wants to dwell too much on the topic, there is always the potential for disaster.

There are degrees of disaster ranging from a minor system malfunction resulting in the loss of some data, to a total system breakdown. As an organization becomes more and more dependent on the computer for its information, a major system breakdown (eg. a head crash on a disk drive) can temporarily paralyze the organization. The problem with micros can be even more acute if the software and system do not include elaborate disk backup and recovery schemes.

Some organizations develop a disaster plan. They try to identify a department or organization which uses the same hardware as they do, and make arrangements to run their programs on the other computer in case of a total system failure. A reciprocal agreement is usually good insurance for both parties involved.

One word of comfort though. Computer equipment is becoming more and more reliable. With the proper planning and site preparation, the likelihood of a disaster can be kept to a minimum.

Decreased Flexibility

Computers are very exact machines. They are exact in their output, and they require precision in their input. Because most computer systems have not yet attained a level of artificial intelligence that allows them to think, reason, and make judgments the way we do, they require exact data to be input in a fairly regimented way. Depending on the set-up of your present system, you may need to adjust to the computer way of processing data, which will probably be less flexible than your manual system.

1.6.2 Benefits

So far, we have paid considerable attention to the time and cost involved in implementing a computer system. At this point you may be beginning to wonder whether the benefits could possibly outweigh the costs and the time commitment required. Rest assured, there can be no doubt that there are very substantial benefits as well. Why else would computer use be so widespread?

1.6.2.1. Monetary

The most obvious, and to many the most important, are the monetary benefits derived from the use of computers. Once the system is up and running, you will be able to accomplish much more with the same staff or fewer staff, and probably see a decrease in the number of part time staff required.

Another monetary benefit is the more efficient use of existing resources, and in some cases longer equipment life.

1.6.2.2 Non-Monetary

Computer use can result in non-monetary benefits as well. One of these benefits is the ability to access information and perform tasks more effectively.

"Response time on facility bookings and program registration is 75 percent improved."

G. Bell
Facilities Coordinator
Community Services
City of St. Albert

Information generated by a computer is usually much more accurate than manually produced information.

"More detailed information is available in less time than with a manual system."

J. Mathison
Comptroller
Kitchener-Waterloo YMCA

There is a decrease in the amount of time spent performing tedious and time consuming tasks, often resulting in higher morale.

"The jobs associated with producing programs and results for a swim meet are very time consuming and are conducted in a tight time frame. The use of computers has lessened the workload associated with this and as it is generally more pleasant work we have less difficulty finding volunteers".

E. Batstone
Thunder Bolts Swim Club

Many organizations have found that as staff are spending less time performing tedious tasks, more time is available for other responsibilities. This often results in a wider job scope for many employees.

"Staff morale has improved because of challenges and less frustration."

F. Weindel
Director
Administration Division
Scarborough
Parks & Recreation Dept.

2. TECHNICAL/PHYSICAL ISSUES

The issues discussed in this section will include procurement alternatives, contracts, security of information, and physical site preparation.

2.1 Procurement Alternatives

When considering the implementation of a management information system there are a number of alternatives for the procurement of computing services. Some of the most

popular alternatives include time sharing, service bureaus, joint ventures, leasing, and of course, purchase.

Time Sharing

Time sharing is one option. If you subscribe to a time sharing service, the time sharing company will provide one or more CRT's or terminals, for you to access the programs which are available on their computers. You are then charged by the amount of time you are signed onto their computer.

Currently, time sharing services are available for recreation applications such as program registration, facility scheduling and reservations. Various financial functions and municipal administration functions are also available.

There are a number of advantages to using a time sharing service. First of all, it is one of the least risky ways of introducing computer technology into an organization. The programs have usually been well tested and are problem free. The initial investment of funds is also low. Time sharing companies usually provide an entire starter package which includes hardware, software and user training.

There are some disadvantages as well. Time sharing programs are usually modeled after some specific departments. If your department conducts some procedures quite differently than the model, it might be difficult to ask for changes because changes in the program will affect other users of the same program as well.

Another disadvantage is that a user usually subscribes to a set of programs. The type of programs used and the access time is usually predetermined. This may cause the system to be quite inflexible to users changing needs. The long term costs of this option may also be quite high.

Service Bureau

A service bureau is quite similar to a time sharing agreement, except that in most cases the user does not have direct access to the service bureau's computer system (ie. you probably would not have a terminal in your office). The user usually gives the service bureau the data in printed form, often on the service bureau's own forms, and

the service bureau inputs the data and produces the required reports. The disadvantages to using a service bureau are quite similar to those to time sharing.

"We are working with a service bureau which also serves other clients so it is usually difficult, expensive, and/or time consuming to institute desired changes."

D. Young
Supt. of Parks
Town of Oakville

Using a service bureau and having your own computer should not be considered mutually exclusive. Some small departments may find it worthwhile to use a service bureau for financial functions and perform other functions on their own computer.

Joint Venture

Joint ventures are another procurement option. There are various forms of joint ventures. A number of departments or agencies may get together to take advantage of volume discounts in purchasing hardware. Joint ventures can also save money in software development or training. It may also be possible for a few small communities to get together to purchase one computer, install it at one of the communities, and allow all parties to access the computer via remote terminals. If considering a joint venture, you will have to find a department or organization with similar needs and with whom you could share a congenial working relationship.

Leasing

Leasing may be a particularly attractive option if your organization can take advantage of the tax deduction of leasing costs. Due to the high rate of change and advancement in the industry, the cost for a short term lease (one year or less) is usually very high. For example, it is not unusual for some leasing companies to recover the cost of their system in less than two years.

Purchasing Equipment

If you decide to purchase computer equipment, here are a few suggestions to go by.

One rule of thumb: the less you know about computers, the more you may want to consider the purchase of a main stream product. The micro computer industry is very volatile in nature. It is not uncommon to see a company start nowhere, become a multi-million dollar business and declare bankruptcy, all within two years.

The computer market is very competitive and full of what appear to be good 'deals'. It is not uncommon for a lesser known product to have 20 or 30 percent more capabilities for the same price as the main stream product. Some of these products are very good. However, unless you are familiar with the market, or have an extremely competent or reliable counsel, you should be very careful in purchasing such a product.

Before you make a decision to purchase, you may want to consider the user base of the product, ie. the number of users a product has, and the length of time it has been around. Sometimes a product has been brilliantly conceived, but because of improper marketing strategies, or a lack of financial resources, it has been unable to endure the fierce competition in the marketplace. If you have purchased from such a company (hardware or software) and the company goes under, the subsequent support for your product may be questionable.

When looking at software as well, the user base is very important. If only a few people in your region are using the same software tools as you, you could be taking some unnecessary risks. For example, what would happen if you had a disagreement with the only quality programmer in your area? What would your choice be if he charged you an unreasonable amount for any programming that you required?

Keep in mind as well, that the price of micro computer software should not be a major determinant in the purchase of the package. Once you have decided to use a package, the cost of data input and the value of the staff time committed to learning to use the package will be many times greater than the value of the package itself.

Dealing with Vendors and Consultants

Be cautious when dealing with vendors and consultants. When selecting a consultant, you may want to look for one who has dealt with similar applications before, and has a good track record. Beware of many salesmen or computer dealers who pretend to be consultants. It is usually very difficult for a consultant to be objective when his or her recommendations are directly related to his income.

In the micro computer industry, you may find that some salesmen don't really know what they are talking about. Some have had little or no computer training. Although they may label themselves as 'business systems consultants' their training may be limited to the product training sessions offered by manufacturers.

2.2 Contracts

There are a few things to keep in mind when signing contracts for equipment or services. The first of these is that the contract is only good if the company is around to honour the contract. It serves little good if the company offers you a five year warranty but goes under after a year. If in doubt, you may want to seek legal counsel in reviewing the purchase and maintenance contracts.

It takes time and planning to write up thorough terms of reference for a computer system. Be as specific as possible regarding the deliverables of the contract.

A contract should at least include the following:

1. The details of what the system consists of including hardware, software, connecting cables, etc.;
2. delivery date and penalty clauses;
3. the capabilities of the system ie. what should it do;
4. how well should it do it, and;
5. what happens if it doesn't perform as cited.

Contracts that are made verbally are usually not very satisfactory. First of all,

there may be problems in communication and different opinions regarding what was actually discussed. Secondly, there is quite a high turnover of staff in the computer industry and the sales person with whom you have a verbal contract may not be there by the time you go to pick up your equipment. We've had experience with one contract where the sales person actually changed companies three times between the signing of the purchase order the delivery of the equipment (2 months). If you have your agreement down on paper, there will be less opportunity for misunderstanding.

"We had difficulties with the software contractor stemming from staff turnover, poor communication, no written specifications, weak analysis of Y's needs ..."

F. Galloway
Director of Operations
London YM/YWCA

Because of the complexity of most applications, for contracts dealing with software development, it is often difficult to spell out in minute details all the aspects of the application. To a certain degree, the integrity and reputation of the programmer is still important.

2.3 Security of Information

Security of information pertains to two major areas. The first of these is security from intentional tampering with data, the second is security from unintentional tampering with data.

Intentional Tampering with Data

On the surface, the possibility of someone intentionally tampering with data stored on the computer is not a prime concern for most parks and recreation applications. However, over time, a great deal of participant information will become stored on the system.

We may want to think about safeguarding the information so that it will not be used in some unintentional way. For example, we may not want a sporting goods manufacturer to gain access to the system to extract the names of participants in a certain age group or involved in a certain activity and to use

this information for his advertising purposes. Or to have an insurance company gain access to the file to obtain health or demographic information for his own purposes. As well, it may be preferable if certain types of internal information, such as payroll, were not accessible to all staff.

Different types of information have different levels of security requirements. Although many business software producers provide several levels of security for their files, the security systems for most micro computers are still rather unsophisticated. As one industry spokesman stated:

"Micro computer security systems are effective in screening out amateur snipers only. If worse comes to worse, an information thief can take your entire system with him in the trunk of his car."

Unintentional Tampering with Data

Unintentional tampering with data refers basically to the accidental loss or damage to data. None of us ever expect to lose any data, but as Murphy's law says:

"If it can go wrong...it will".

One of the main merits of storing data on a computer is the fact that a great deal of information can be stored in a small space. For example, 40,000 pages of information could easily be stored in a space about half the size of a shoe box. The problem with this storage ability though, is that if data is lost, it is often lost forever. Most of us have heard of, or even worse, have had personal experiences of this type. This leads to the importance of making data back-ups.

There are many types of back-up schemes. At the very least there should be two alternate copies of daily back-ups, plus one weekly back-up placed somewhere on the site, and another weekly back-up stored somewhere off the premises in case of fire, water or some other form of damage to the building. It is important to follow your backup procedures religiously. It is costly, frustrating and sometimes catastrophic to lose your data if you don't have proper back-ups.

2.4 Physical Site Preparation

Physical site preparation is something that should be done before the computer arrives. It's not necessary to go out and spend thousands of dollars on modern computer furniture, but some basic preparation will be necessary to ensure the safe and efficient operation of the equipment.

Although a micro computer can function in the basic office environment, some aspects require special attention.

Power Source

Each computer should have a dedicated, grounded power circuit. Something as insignificant as an electrical kettle or coffee maker plugged into the same circuit may cause you to lose hundreds of pages of information.

Some remote areas such as camps or parks may also be concerned with the possibility of power surges (sometimes resulting from electrical storms, etc.). In such cases, a power surge regulator may be a good investment.

Static Electricity

Static electricity in the vicinity of the computer can alter or destroy information. Most offices generate a fair amount of static electricity, especially if they are carpeted and particularly in the winter. Anti static mats and anti static sprays are readily available and are quite inexpensive.

Hardware Placement

Although micro computers are quite small and quiet, they still require some space and generate noise and heat.

If possible, place the computer in a corner where it will not interfere with the daily operation of your organization and where cables and wires will not get in the way of traffic. There is nothing quite as frustrating as losing information because a colleague accidentally jostled a cable while walking by.

Keep in mind the number of people who will be using the equipment. If a number of

people will be using the computer, you may want to place it in a separate work area. Studies have shown that the territorial instinct of office workers can prevent optimal use of the equipment if it were to be placed in one individual's work space.

Storage space will be required for diskettes, computer paper, other computer supplies, as well as for the printouts generated by the computer. All things considered, you will probably find that a computer and all its peripherals require more space than you first expected.

Most micro computers generate some noise when in operation. Fans and disk drives are not exactly silent and tend to bother some people more than others. The real noise generator however, is the printer. Generally letter quality printers are louder than dot matrix, but even a dot matrix in close quarters can be very irritating. You may want to consider getting an acoustic cover to surround the printer and cut down on the noise, or at the very least place the printer some distance away from phones. It can be very difficult to carry on a telephone conversation with a printer working beside you.

Micro computers also generate heat when in operation. This is not a major concern if the equipment is in a large space. However, a computer operating for a few hours in a small room with little air circulation will increase the temperature by a surprising amount. You will probably find that you need air conditioning -not for the computer - but for your staff.

Lighting

When trying to find a location for your hardware, keep in mind the problem of reflected glare making it difficult to read the screen. Glare can result from electric lighting or from natural light coming in through a window. Solving the problem of glare can be as simple as adjusting the position of the screen. Anti glare filters are also available and are usually quite inexpensive.

3. HUMAN ISSUES

The section on human issues will include the following information: attitude, user

involvement, health concerns, education and the selection of the initial application.

3.1 Attitude

Besides financial constraints, one of the biggest obstacles faced by parks and recreation professionals in adopting computer technology appears to be our own attitude towards this new technology. Since most of us are not technically inclined, (or interested in being technically inclined), sometimes we feel bewildered or intimidated by this fast paced, jargon filled technology. In addition, those who have been "around" (meaning mostly senior administrators), are suddenly faced with a new management area about which they feel quite ignorant. It is sometimes discouraging to find that one's expertise in one field does not necessarily carry over to another.

Although the way many of us feel about computers is understandable, this type of attitude may prevent us from fully harnessing the power of this new technology. Furthermore, upon close examination, we may find that many of our fears and apprehensions may not be totally realistic to start with.

We must understand that the implementation of a successful information system takes both management know how as well as technical skills. Some senior administrators make the mistake of trusting the planning and design of computer applications to technical experts without getting involved themselves. Because most technical experts do not possess the knowledge and deep understanding of your operation, the results of this type of arrangement are usually less than satisfactory.

It is important for us to realize that the implication of implementing a computer system is more than the installation of hardware and software. It can alter the nature of your information, the basis on which you make management decisions.

In order to develop a management information system which truly meets your needs, you must play more of a hands-on role in the planning and implementation of your computer system. Getting involved does not mean learning computer programming or taking courses about

electronic technology. Rather, getting involved means getting a good conceptual understanding of what the computer system can or cannot do for you, and the managerial implications of those capabilities. It also means that you may want to approach computerization as any other major administrative task that has long term and major implications for your organization. You must devote the appropriate time, attention and judgment to the tasks involved.

3.2 User Involvement

One of the most important determinants of success is whether or not the end-users were involved in the planning and implementation of a system. This is one area in which parks and recreation practitioners should have a good understanding. In planning for recreation programs, we know that we can act as experts and plan all aspects of programs for our participants, or we can approach leisure services from the role of facilitator. That is, giving the participants the necessary tools and providing the proper environment for them to plan and conduct their own programs.

The facilitator role in recreation planning can be carried over to computing as well. More and more computing software is enabling non technical users to perform their own tasks. At the very least, they should have input into the system to make them feel it is 'theirs'.

There are two benefits to this approach. One is that if staff feel they have contributed to the design of the final product they will feel a greater personal commitment to making the system work. This will decrease the possibility of staff resistance to the new technology. When an organization is planning for implementation of a management information system, rumours are likely to spread through unofficial channels. Increased staff awareness and input will help ensure that the rumours are based on fact and not fiction.

The second reason for this approach is that any staff limitations will become apparent in the planning stage. It is not difficult for a system to be designed without taking into consideration some very basic, and in

retrospect, obvious staff limitations.

One of the worst, and yet unfortunately quite common, ways to plan an information system is to conduct the entire process in isolation from the end users. When the project is completed, the planners hand the system over to the users and say "This is your system... use it!".

Take for example a parks maintenance system which was designed for a city in the southern United States. The technical aspects of the system were brilliantly designed, however, there was no staff input in the planning stage. The end result is a system which requires the field workers to input approximately 50 items of information per day. The only problem is that in many cases the field workers could not read or write and were thus unable to provide the necessary information. The system also provides many more reports than management really needs. Needless to say, in spite of its technical perfection, the system fails miserably.

This type of error would be unlikely to happen if both the parks administrators and the field staff had been involved in the planning process.

In considering automation, we must respect the worth, knowledge and feelings of the end user. They may be unfamiliar with computer capabilities and terms, but they know their own jobs and operational environment better than anybody else.

3.3 Health Concerns

There are three main health concerns related to the use of computer technology. The first of these is the physical effect of working at a computer terminal, the second is the potential effect of radiation which may possibly be given off by the terminals, and the third are possible neurological effects similar to those resulting from watching television.

Physical Effects

The physical effects of working at a computer display may include headaches, eyestrain, and neck, back and shoulder pain. Headaches and eyestrain may result from the glare or brightness of the screen. Neck,

back and shoulder pain may result from the user having to alter his sitting position to avoid screen glare, or look back and forth from screen to paper, etc.

Exposure to Radiation

This is perhaps one of the most publicized and controversial issues involved in the use of computers. Although most studies indicate that computer displays do not emit any more radiation than other normal office elements, there are some concerns relating to birth defects, miscarriages, cataracts, etc. resulting from prolonged exposure to the displays. Research is still non-conclusive.

Neurological Effects

Some studies have indicated that watching television may have adverse effects on brain wave patterns. It is not the content of television which is a concern, but rather the light radiating from the screen. A computer display uses the same technology and studies are underway to determine whether the screen may have similar adverse effects.

3.4 Education/Training

Computer education can be approached from four different areas: conceptual, hands-on, programming and management systems information training.

Conceptual

One of the main problems faced by parks and recreation practitioners is an overall lack of knowledge about the new technology and the possible uses in parks and recreation.

(An obstacle in the planning and implementation of a computer system is) "Obtaining a detailed listing from staff of our needs for the program without fully understanding the full potential of computerization."

D. Brown
Director, Administration
Services
City of North York
Parks & Recreation Dept.

Many sources suggest that the first step in planning for a management information system is to write down what you want the computer to do for you. This appears to be very sound advice, however, this step might be pre-mature if you don't understand the capabilities and limitations of a computer system.

As an example, let's say that a person knows of only one leisure activity, say swimming. If you ask him what he wants to do in his leisure time, his answer is very predictable. However, if you expose this person to a wide array of recreational activities, and then ask him the same question, the answer he gives will be more informed.

The same is true for new technology. For example, if word processing is the function that you're familiar with, then it's quite unfair to expect you to list what you want the computer to do for you. It is therefore very important to get a basic conceptual understanding of what a computer system is, its basic capabilities and limitations, and potential uses in our profession. The listings in this guide may serve as a starting point for your investigation.

Most courses relating to introductions to computers or computer literacy will provide a basic conceptual understanding of computers. The course should introduce the users to the basic components of a computer system as well as some of the most commonly used computer jargon. If properly conducted, this type of course should help alleviate fear of automation.

A good introduction to computer technology is important to dispel the myths many people have about computers. There appear to be two extremes amongst people who have had little or no previous experience with computers. There are those who feel that a computer can do absolutely everything, and then there are those who feel it won't be any help at all. Many individuals are also concerned about job loss resulting from the use of computers. It should be made clear that this misconception probably stems from a lack of understanding and fear regarding this technology. A computer should be considered nothing more than a very powerful and versatile tool.

Hands-On Computer Training

One of the major concerns regarding computer use is, "Inadequate introduction and on-going training of individuals making use of various systems. This promotes inefficient use of both the hardware and the software."

B. Smale
University of Western
Ontario
Department of Geography

Hands-on introduction to computer use is usually very software specific. This type of instruction is designed to teach users the commands they will have to know to operate the custom written or generic type of programs (word processing, database, electronic spreadsheet etc.)

A well executed hands on first encounter with computers can do wonders to alleviate the fear of computers for many adults. In a way it's a good environment to prove to themselves that they can master and benefit from the new technology.

Programming

When many of us think of using computers, we naturally think of the programming aspect. These days, most end users will not be required to master this skill. A great deal of the modern generic software is designed to be used by individuals with no programming background. Programming in the traditional sense, should only be considered as a training option if the individual wants to become very involved in data processing.

Management Information Systems Concepts

Administrators who are in charge of the implementation of a management information system may want to consider some training in the planning and implementation of a management information system. Select courses which cover training with a focus on the managerial rather than the technical aspects of planning and implementing information systems.

3.5 Selection of Initial Application

It is important to select the right kind of application for your first computerization project especially if you have a number of skeptical users.

The natural tendency is for organizations to select the most cost-benefit worthwhile application to put on the computer first. This approach may be correct from a technical and financial point of view, but depending on the overall situation, it may not make the most sense in the long run.

When selecting this first application, try to select one with a high probability of success, and one that is highly visible. If you have a choice, select a group of enthusiastic users for the pilot project.

Most administrators who have gone through the process of bringing up a computer system will probably agree that there is a great deal to learn and a great deal to do with a new computer system. This first application should also be kept relatively simple.

Once the initial application has been shown to be successful, the skeptics will be more open to the concept of further computer use. Remember that facts tend to speak for themselves. On the other hand, if the first application is not a success, it will take a long time to overcome the lost confidence and other negative attitudes. Oftentimes, the human aspects of the implementation process can, in the long run, be more important than the short term costs vs. benefits.

Epilogue

After having done the research for this computer guide, it appears as if we are at the beginning stage of the utilization of this powerful and versatile tool. It seems that we have finally begun to tap the potential of this new technology.

In order to ensure the prudent and creative use of computers in the future, our attitude towards the new technology must change. We must stop looking at it as a somewhat mysterious and technical subject, and see it as it really is, a friendly management tool.

Also, we have to learn to manage with computers. With a properly designed information system, the computer can generate information with a high degree of detail and sophistication. However, many of us may need further training in management

skills in order to benefit fully from this new technology.

Another area which deserves more of our attention is the communication capability of computers. For example, we may want to devote more resources to the exploration of how an electronic messaging and data base system can facilitate the learning and sharing of knowledge and ideas in our profession.

Our profession has always been very people oriented. It is important for us to keep our focus on the well-being of people even when we are dealing with a technical area. It is hoped that we will continue to share our creative ideas in the future applications of this new and exciting technology.

Appendix

- A. Additional Readings
- B. Glossary

Appendix A

Additional Reading

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Appendix B

Glossary of Computer Terms

ASCII	American Standard Code for Information Interchange. Computers use binary numbers (combinations of ones and zeros) to represent letters, numbers and special characters. The ASCII code specifies which binary number will stand for each character and provides a standard that allows computers from different manufacturers to 'talk' to each other.	Assembly Language	A means used by programmers to communicate with a computer. Assembly language is a type of 'low level' language that lies between 'high level' languages such as BASIC and PASCAL, and machine language (the fundamental codes of the computer).
		BASIC	Beginners All Purpose Symbolic Instruction Code. This is the most popular programming language for personal computers.
Acoustic Coupler	A mechanical device that allows a telephone hand set to be connected to a modem to enable communication with other computers. This term is also used to refer to the entire modem.	Backup	An extra copy of information stored on a disk or tape. If the original data stored on the disk is damaged, the information is still available on the backup copy.
Address	The memory location of a piece of data, software or hardware.	Batch	A processing mode where a program is submitted to the computer, and the result is then delivered back. There is no interactive communication between programmer and user.
Algorithm	Step-by-step specification of the solution to a problem. A problem is conceived, an algorithm is devised for its solution. The Algorithm is then represented by a flow chart. The flow chart is finally translated into a program.	Baud Rate	Number of bits of data transmitted in one second; eg. 300, 1200, 2400.
Alphanumeric	All letters, numbers, and symbols which can be processed by the computer. (see ASCII)	Binary	A word used to describe a number system that uses only ones and zeros' an efficient way of storing information in a computer since the microscopic switches in a computer can only be ON (1) or OFF (0).
Application Software	Software designed to accomplish a specific task such as accounting, word processing, registration, etc. Also referred to as application programs.	Bit	Binary digiT. The smallest piece of information (either a one or a zero) that the computer can handle at one time. Eight bits constitute one byte.
Assembler	A computer program that converts the programmer's instructions into a language readable by the machine.		

Boot	Another term for starting or 're-setting' the computer.	Command	A keyboard or program instruction that tells the computer what to do.
Bug	An error. A hardware bug is a malfunction or a design error in the computer or its peripherals. A software bug is a programming error.	Compatibility	The ability of one computer to run programs and operating systems written for another computer. The ability of one device to communicate with another device or software program.
Byte	The basic unit of measure in a computer's memory, representing a simple alphanumeric character (A, B, C, 1, ?, &, etc.). One byte is equivalent to eight bits.	Compiler	A translation program that converts high level instructions into a set of binary instructions for execution. Each high level language requires a compiler or interpreter. A compiler translates the complete program which is then executed. Every change in the program requires the entire program to be translated and executed again. A disadvantage of compilers is that the resulting code is more cumbersome and executes more slowly than the code generated by a good programmer in assembly language.
COBOL	COmmon Business Oriented Languages. A computer language developed specifically for business use.		
CPU	Central Processing Unit. The part of the computer that collects, decodes and executes instructions. Often made up of a microprocessor and associated circuitry.		
CRT	Cathode Ray Tube. The television-like screen or tube that displays information used in a program. It is also called the monitor or video monitor.	Crash	A situation in which the computer becomes misdirected or blocked, due to a hardware or software malfunction. A head-crash in a disk system refers to the accidental impact of the read/write (R/W) head on the disk surface.
Character	Any symbol, number, letter or punctuation mark that can be processed by a computer.		
Chip	An integrated circuit that contains many logic elements that perform specific calculations.	Custom Software	A computer program that is custom-designed to meet a particular users specific needs.
Circuit	A pathway that carries electrical current.	DBMS	Data Base Management System. A software program that manages and maintains your data base.

Data Base	A collection of related information that can be stored in the computer and retrieved in several ways. One example is a mailing list.	Hard Disk	A magnetically coated metal disk, usually permanently mounted within a disk drive. Capable of storing 30 to 150 times more information than a floppy disk.
Debug	To go through a program or hardware device to correct mistakes.	High Level Language	A programming language that allows a person to give instructions to a computer in English rather than in the numeric (binary) code of ones and zeros. BASIC, COBOL, and PASCAL are examples of high level languages.
Documentation	Instructional materials that describe the operations of an individual computer program or piece of system hardware.	Interface	The ability or inability of two components or systems to communicate with each other. This can be expressed as either a language interface or physical hardware interface.
Dot Matrix Printer	A type of printer which forms characters by combining multiple dots.	Internal Memory	Also referred to as Internal Storage, Main Storage, or Primary Storage. Temporary memory within the computer is controlled by the CPU.
Downtime	Any period of time when the computer is not working due to hardware or software malfunction.	K (Kilo)	One thousand. For example KILOBytes means one thousand bytes, etc.
Electronic Mail	Sending and receiving information or messages by computer.	Language	A code that the computer understands. Low level languages resemble the fundamental codes of the computer. High level languages such as BASIC and COBOL resemble English.
FORTTRAN	FORMula TRANslator. A high level language used mainly for mathematical computations. Although FORTRAN is available for some small computers, it is used mainly with large computer systems. (see language and high level language)	Letter Quality Printer	A printer, usually an impact printer, that generates documents of typewriter quality.
Firmware	A program permanently fixed onto a memory chip (ROM), ie. software on a hardware support. These software instructions are not lost when the computer is turned off.		
Hard Copy	Printed copy of the information generated by a computer. Also referred to as a printout.		

Machine Language	The 'native' language of a computer comprised of the fundamental symbols, usually ones and zeros, that the computer is capable of recognizing and to which it can respond.		computer is immediately altered based on the new data. The individual generating the information is usually in direct communication with the computer.
Mega	Prefix for a million. For example a MEGabyte equals one million bytes.	Operating System	A group of programs that act as intermediaries between the computer and the application software. The operating system takes a program's commands and passes them to the central processing unit in a language that the CPU understands. Application programs must be written for specific operating system such as DOS, OS, CPM, etc.
Menu	A list of operations or commands available in a computer program. A menu is usually displayed on the computer screen at the beginning of a program and offers the operator a choice of options.		
Modem	MODulator-DEModulator. A device that converts a computer's electronic signals to audible sounds (modulation) for transmission over the telephone, and back again (demodulation) for reception via telephone.	Output	Information generated by the computer program and presented to the user in some form.
		Packaged Software	Computer programs that are available commercially through retail stores.
Network	A device capable of linking two or more computers by wire, telephone line, or radio links.	Parallel	Two or more computer operations happening at the same time. A parallel interface is one that receives and sends out a number of bits at the same time.
OEM	Original Equipment Manufacturer. Company that buys hardware, writes applications, and sells both as a complete system (also referred to as a systems house).	Peripheral	Any input, output and auxiliary storage devices that are connected to and controlled by the CPU.
Off-Line	Mode of processing whereby data is prepared for entry independent of a computer, and then entered into the computer. The person generating the information is usually not in contact with the computer itself.	Pixel	(From Picture Element) The CRT or screen is divided into rows and columns of tiny dots, square or cells. Each of these is a pixel.
On-Line	Mode of processing whereby data is entered into a computer, usually via terminals, and the information within the	Plotter	A printing mechanism capable of drawing lines rapidly and accurately for graphic presentation.

Port	A receptacle for connecting peripheral devices to a computer.	Sequential Access	Method of obtaining records from or placing records to a file in a specific sequential order.
Printer	A mechanism that reproduces, in printed form, the information entered into or generated by the computer. Impact printers form characters by physically striking a ribbon and paper. Thermal printers make impressions by applying heat to heat sensitive paper. Some printers can produce graphs as well.	Serial	Computer operations occurring in sequence. A serial interface is one that receives and sends out one piece of information at a time.
		Software	A set of instructions that cause the computer to perform certain tasks in a certain order to obtain specific results. It is like a recipe that is used to produce a cake.
Program	A sequence of instructions which result in the execution of an algorithm. Programs are essentially written at three levels: (1) binary (which can be directly executed by the computer), (2) assembly language (symbolic representation of the binary), (3) high level language (such as BASIC), requiring a compiler or interpreter.		
RAM	Random Access Memory. The part of the computer's memory that allows both reading and writing, as opposed to ROM (Read Only Memory). This part of the memory is accessible to the user. Information contained in RAM is lost when the computer is turned off.		
ROM	Read Only Memory. The part of the computer's memory that allows just reading and is used to hold information that never changes, and cannot be altered by the user.		
Random Access	An access method where each word can be retrieved directly by its address.		
Real Time	Immediate and concurrent processing.		